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ABSTRACT

The Pell Grant Quality Control Study of 1982-83, the third stage of a contract with the Department of Education, was designed to identify program error rate, to measure the impact of increased validation activity, and to propose corrective actions to reduce the misallocation of program funds. A nationally representative sample of approximately 4,000 students was drawn from a stratified random sample of 317 participating institutions. The results showed that Pell Grant recipients in 1982-83 were granted $129, or 13 percent, more than they should have been. Both student and institutional error dropped between 1980-81 and 1982-83. The study confirmed that institutions complied with the revised validation requirements for the Pell Grant program in 1982-83, reflected in a $22 million reduction in the net Adjusted Gross Income error. The findings are presented in Volume 1 in terms of an overview of program-wide error, institutional error, student error, validation, and trends. In general, it is concluded that (1) the upward trend in error noted in 1980-81 has been turned around, and (2) the amount of overawards has decreased while the amount of underawards has increased. Appended are error definitions and equations. (Author/LB)

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ED243405

QUALITY IN THE PELL GRANT DELIVERY SYSTEM

VOLUME I

FINDINGS

Submitted to

OFFICE OF STUDENT FINANCIAL ASSISTANCE
DEPARTMENT OF EDUCATION

CONTRACT NO. 300-80-0952

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APRIL 1984

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SUMMARY

The results of the 1982-83 quality control study of the Pell Grant program are presented and discussed in this volume. In general, the findings are indicative of improvement but also demonstrate the need for continuing management attention.

Total dollar error is estimated to be $256 per recipient, or $650 million, representing 27 percent of the total program expenditure for this program with 2.5 million recipients. About 6 out of 10 recipients received incorrect awards.

Other key findings include:

- On average, Pell Grant recipients in 1982-83 were granted $129, or 13 percent, more than they should have been. This compares with an average $170 net error in 1980-81 and represents a 24 percent decrease in average net error over the two year period.

- The net effect of the $129 average overpayment for the program's 2.53 million recipients in 1982-83 was an estimated $326 million overpaid by the program. Overawards exceeded the absolute value of underawards by over 3 to 1.

- More than 62 percent of the students had errors in award over $2 and more than 42 percent had errors in award over $100. An estimated 11.7 percent of Pell Grant recipients (300,000 students) should not have been given a grant. This represents a 36 percent decrease from the estimated 470,000 ineligibles in 1980-81 who represented 20 percent of that year's recipients.

- Just under 40 percent of the Pell Grant recipients made mistakes in the data submitted on their application forms that affected their awards. These student-generated errors resulted in a net $86 overaward per recipient in the program or $217 million overall. Student-generated overawards exceeded the absolute value of underawards by almost 5 to 1.

- Mistakes by institutions caused errors for 33 percent of all recipients. Institution-generated errors resulted in a net $99 million in overpayments to Pell Grant recipients, with overawards exceeding the absolute value of underawards by about 2 to 1.

- Lack of a Financial Aid Transcript was the major contributor to institutional error. For analytic purposes, the lack of a Financial Aid Transcript was combined with the two other procedural errors: lack of a signed Statement of Educational Purpose and lack of a valid (original) Student Aid Report. Disregarding these procedural errors, institutions actually underpaid Pell Grant recipients a total of $13 million dollars with underawards being about 13 percent greater than overawards.

- The 1982-83 Pell Grant Program experienced an estimated $217 million in net student error, or $86 per recipient.

- Dependency status error was the largest single form of student error, comprising approximately $64 million in payment consequences.

- The top six forms of student error were not directly verifiable through 1982-83 validation procedures.

- The vast majority of institutions collected the required verifying documentation for their students who were "flagged" for validation by ED. The Federal tax return was the predominant form of documentation.

- Validated students were more likely to revise their Adjusted Gross Income (AGI) and Federal taxes paid initial application data than were non-validated students. Further, those selected for validation and making revisions were more likely to raise their AGI and reduce their taxes paid--revisions that tend to lower eligibility--than were those not selected for validation.

- Among students who made changes to their application, validated students were much more likely to show an increased SAI, leading to a decrease in award. Corrections behavior in this direction was very infrequent among nonvalidated students.

- Most institutions believed that they were unduly burdened by the expanded nature of the 1982-83 validation process. The reasons cited most often were delays, extra work, or confusion due to the late arrival of the Validation Handbook; difficulty in verifying Social Security benefits and Veterans Administration benefits; and difficulty in obtaining documentation from students.

CHAPTER 1
INTRODUCTION

This volume is one of a series that documents Stage Three of the Pell Grant Quality Control Study. The other two volumes concern the methods and procedures used and recommendations for actions to correct the problems found.

In September, 1980, the Office of Student Financial Assistance (OSFA) of the U.S. Department of Education (ED) contracted with Advanced Technology, Inc., of McLean and Reston, Virginia, to conduct a three-year study to assess the accuracy and reliability of the Basic Educational Opportunity Grant (BEOG) Program and recommend administrative changes to improve it. Westat, Inc., of Rockville, Maryland, has served as a subcontractor to Advanced Technology throughout the study. In 1981, the name of the program was changed to the Pell Grant Program.

During Stage One of the study--the first year of the contract (1980-81)--Advanced Technology and Westat examined a national sample of Pell Grant recipients to determine eligibility and award calculation error. Westat drew the national sample of 4,500 recipients and interviewed them and their parents about their eligibility and financial situation, examining documentation at the same time. Advanced Technology hired staff to visit the institutions attended by these students, examine the records on the students and any supporting documents on file, and interview the financial aid administrators. This data collection procedure was also followed in Stage Three--the third year of the contract (1982-83)--and is described below.

The Stage One study determined program-wide rates of discrepancy between actual awards and the awards that should have been made according to program rules and the documents examined, and attributed these discrepancies to institutions, recipients or their parents, and application processors. On the basis of these discrepancy rates, the study also identified error-prone groups of recipients. Finally, Stage One suggested feasible corrective management activities to reduce error rates for every area in which error rates were excessive.

During Stage Two (October, 1981 to December, 1982) Advanced Technology began the design of a quality control system for the Pell Grant program and made some error analyses and corrective action recommendations for specific features of related student aid programs. The Department of Education began installing corrective measures, including a requirement for greatly increased validation of Pell Grant applicants on a limited number of application items, rather than a small sample on more items. In 1983, the quality control system design component became a separate project.

Stage Three of the study (1982-83) has essentially been a replication of Stage One, with the objective of determining changes in program error over time, especially changes potentially brought about by the extended validation requirement. As in Stage One, Westat developed a sampling procedure and interviewed the sampled parents and students, and Advanced Technology visited institutions to examine documents in student files and interview financial aid administrators. During Stage Three Advanced Technology made a preliminary visit to each of 317 institutions to draw the sample of 4,109 students on site (during Stage One Westat had drawn the sample at its home office from lists supplied by the institutions) and to gather data for an assessment of compliance with the new validation requirement.

1.1 THE PELL GRANT PROGRAM

In the 1982-83 academic year, the Pell Grant program distributed over $2.4 billion to over 2.5 million students who attended over 6,000 institutions of postsecondary education. These Pell Grants are designed to serve as the base of Federal aid for students from lower-income families. The major purpose of the Federal role in student financial aid is to equalize access to postsecondary education.

The Pell Grant program has certain unique characteristics. First, eligibility standards are uniform across all schools and students. Second, the Pell Grant is portable in that it can be used to finance the cost of education at any eligible school selected by the student. Third, Pell Grant delivery involves numerous actors. For example, a student can apply for a Pell Grant through any of four different application processors. Fourth, it is a Federal program which relies heavily on individual institutions for program administration.

The program has grown steadily since its enactment on June 23, 1972 as an amendment to the Higher Education Act of 1965. In 1973-74 the program distributed $50 million to 185,000 students. Currently, about 2.7 million students are receiving almost $2.5 billion.

1.2 QUALITY CONTROL IN THE OFFICE OF STUDENT FINANCIAL ASSISTANCE

The Office of Student Financial Assistance (OSFA) is attempting to have individuals responsible for the various processes and activities which make up the student aid delivery system assist in quality control. Controlling quality must be a responsibility of these operating groups, with OSFA taking the role of assuring that these groups have procedures and processes in place which will control the quality of their work and activities. This distinction between quality control and quality assurance is a key concept in OSFA's quality improvement program.

The quality improvement program has many facets:

- Pell Grant Quality Control studies
- Development of corrective actions for selected internal "targets of opportunity"
- Vendor quality control requirements for all OSFA procurements
- Validation selection targeting using error-prone modeling
- Quality control regulations for Campus-Based programs currently being developed by OSFA
- Pilot quality control study of Campus-Based programs and GSL certification
- Field testing of Pell Grant Application forms
- Computerized edits as part of the application processing system
- Student financial aid training programs.

1.3 PURPOSE AND OBJECTIVES OF THE PELL GRANT QUALITY CONTROL STUDIES

This study of the 1982-83 program year is the third Pell Grant quality control study. The earlier studies focused on program years 1978-79 and 1980-81. All three

studies have the same general purpose and objectives. For the current 1982-83 study the specific objectives are:

- Estimate program-wide error rates
- Identify probable causes of error
- Develop and analyze alternative corrective actions
- Evaluate the effectiveness of institutional validation
- Compare the 1982-83 findings with the 1980-81 and 1978-79 findings.

The results of this effort are reported in a four-volume report of which this is Volume 1. The four volumes are:

Volume 1: Findings
Volume 2: Corrective Actions
Volume 3: Methods and Procedures
Executive Summary.

Following this introductory chapter, chapter 2 of this volume presents the program-wide estimates of error. Identification of probable causes of error is discussed in Chapter 3 for institutions and Chapter 4 for students. Evaluation of the effectiveness of validation is discussed in Chapter 5, while Chapter 6 compares current findings with previous studies. Methodology is briefly discussed throughout this volume and more extensively in Volume 3. Chapter 7 discusses methodological issues which might affect the validity of the study.

1.4 GENERAL STUDY DESIGN

The general approach to this quality control study is to compare the "reported values" and "best values" for variables used in the application and award determination processes for a nationally representative sample of Pell Grant recipients. Reported values are those supplied by parents and students on the application form or those institutionally provided items utilized by the financial aid and other offices.

"Best values" are derived from information collected for all recipient cases using a multi-instrument data collection process. These instruments include:

- 3,576 completed interviews with the student recipients
- 3,060 completed interviews with the parents of the sampled recipients
- 3,786 completed student record abstracts of student files at the institutions
- 4,007 IRS certified copies of 1040 tax forms for parents, students and spouses
- 349 statements from local tax assessors regarding home values for a 25 percent subsample of the cases
- 365 statements from banks, savings and loan associations, and other financial institutions documenting balances for parents and recipients with large holdings (over $4,000) of highly liquid assets
- Interviews with the financial aid administrators at the 317 schools attended by the sampled recipients
- Complete application histories for each sampled recipient from the Pell Grant central processor
- Information from other ED information systems.

The sample of 4,109 consisted of 4,082 recipients at 317 institutions and 27 students attending institutions which do not administer Pell Grants (Alternate Disbursement System schools). The sample was designed to be representative of all Pell Grant recipients. Detailed sampling issues are discussed in Volume 3, Methodology.

1.5 DETAILED DEFINITION OF ERROR

The proper calculation and disbursement of a Pell Grant require many pieces of data from many sources. Therefore, error measurement requires the identification and enumeration of these elements as well as their combinations. Figure 1-1 shows the hierarchy of data elements used in Pell Grant award determination. The left-hand column represents the most detailed level of data items. Going toward the right represents higher-level combinations of these elements.

Error takes on one of two forms: first, the value for any variable or data element could be wrong. Second, transcriptions or calculations using the basic data elements could be incorrect. There are two ways to measure the occurrence or severity of these errors. One is simply to count the number of times an error occurs

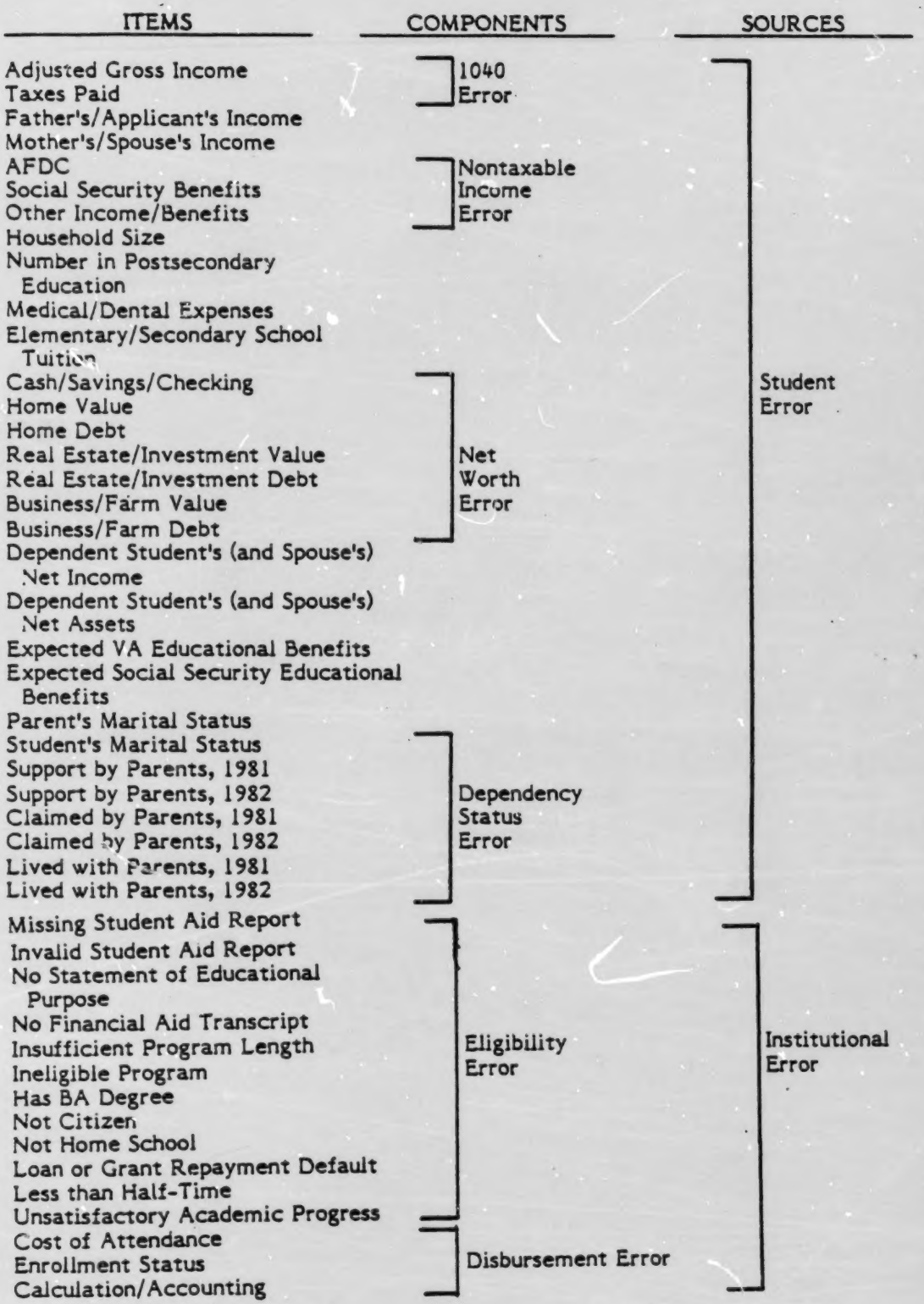

FIGURE 1-1

ERROR COMPONENTS, ITEMS AND COMBINATIONS

and express this as a percentage error rate. The second measure is to determine the change in payment which would result from correcting the incorrect data element or calculation.

The payment consequence error measure is the difference between two payment amounts. The first payment amount is what the student would have received if error in the particular variable(s) was not corrected. This is an award based on reported values. The second payment amount is what the student would have received if error in the particular variable(s) was corrected. This is an award based on best values. This definition of payment consequence can be used for error in one variable, a set of related variables (e.g., dependency status questions or tax form items), all student provided data, all institutionally provided data, or all data elements jointly. The values of variables or data elements not being considered in the error measure are generally set at their application values except for overall student and overall institution errors. Appendix A provides more detailed algebraic representations for the various error composites.

1.6 STUDY ASSUMPTIONS AND LIMITATIONS

The data and estimates provided in the following chapters are based on certain assumptions and are thus subject to certain limitations.

1.6.1 Confirmatory Nature of the Study

The study approach attempts to confirm the values reported by recipients and their parents. The study does not attempt to investigate independently the financial status of recipients and their parents. Thus, errors of commission, people reporting the wrong value for an income source, are likely to be uncovered by the study. Errors of omission, failure to report any value for certain income sources, are not as likely to be uncovered by the study protocol.

As a result, the estimates provided here will understate error to the extent that errors of omission are not uncovered by the confirmatory approach.

1.6.2 Presumption of No Error

The general approach to the study is to assume that the application value for a data element is correct unless there are study data to indicate the contrary. Thus, any data element that the recipient or parent was unable to document was assumed to have been correct on the application and no error was noted. To the extent that sampled recipients fail to respond to certain questions when the likelihood for error is high, this presumption of no error will result in estimates which understate the true level of error.

1.6.3 Timing of Data Collection and Self-Correction

Institutional data collection visits occurred as late in the academic year as practical, given the reporting needs of this study. However, it is possible that the estimates presented here overstate institutional error because they do not reflect the self-corrections generated by the schools in response to program year close-out and reconciliation. We do not feel that this is a serious problem because of our experience with the 1980-81 Quality Control Study. In a special analysis, we utilized 1980-81 end-of-year, reconciled values and found little self-correction to have occurred after the institutional site visit.

1.6.4 Nonresponse Bias

Any survey is subject to the problem of nonresponse bias. This may be caused by people who knowingly misreported data on their applications and refused to cooperate with the interviews. However, our overall student response rate of about 90 percent indicates that the problem is rather well contained. In addition, we have assessed the demographic differences between respondents and nonrespondents and found them to be minimal. Finally, we assessed the sensitivity of the results to various assumptions concerning nonrespondents. This analysis is discussed in Chapter 7.

1.6.5 Experimental Bias

The field work and data collection employed in this study may have caused the sampled recipients, their parents, and their institutions to alter their behavior. The

nature of this behavior modification would be to lower the level of error measured by this study.

To assess this potential downward bias, two control groups were constructed. The results from these two special groups indicate that experimental bias does not cause serious downward bias in the estimates. This also is discussed in Chapter 7.

CHAPTER 2
OVERVIEW OF PROGRAM-WIDE ERROR

In this chapter, estimates of Pell Grant program-wide error for 1982-83 are presented. Highlights of the findings presented in this chapter include:

- On average, Pell Grant recipients in 1982-83 were granted $129, or 13 percent, more than they should have been. This compares with an average $170 net error in 1980-81 and represents a 24 percent decrease in average net error over the two year period.

- The net effect of the $129 average overpayment for the program's 2.53 million recipients in 1982-83 was an estimated $326 million overpaid by the program. Overawards exceeded the absolute value of underawards by over 3 to 1.

- More than 62 percent of the students had errors in award over $2 and more than 42 percent had errors in award over $100. An estimated 11.7 percent of Pell Grant recipients (300,000 students) should not have been given a grant. This represents a 36 percent decrease from the estimated 470,000 ineligibles in 1980-81 who represented 20 percent of that year's recipients.

- Just under 40 percent of the Pell Grant recipients made mistakes in the data submitted on their application forms that affected their awards. These student-generated errors resulted in a net $86 overaward per recipient in the program or $217 million overall. Student-generated overawards exceeded the absolute value of underawards by almost 5 to 1.

- Mistakes by institutions caused errors for 33 percent of all recipients. Institution-generated errors resulted in a net $99 million in overpayments to Pell Grant recipients, with overawards exceeding the absolute value of underawards by about 2 to 1.

- Lack of a Financial Aid Transcript was the major contributor to institutional error. For analytic purposes, the lack of a Financial Aid Transcript was combined with the two other procedural errors: lack of a signed Statement of Educational Purpose and lack of a valid (original) Student Aid Report. Disregarding these procedural errors, institutions actually underpaid Pell Grant recipients a total of $13 million with underawards being about 13 percent greater than overawards.

2.1 OVERVIEW OF CASE/TOTAL ERROR

The dollar amounts and rates of error were defined in several ways. In this section the definitions of the various error types are presented. This is followed by text and tables showing the amounts and rates of error found for 1982-83.

2.1.1 Types of Error

The error figures presented in this report generally fall into one of four categories: absolute error, net error, overaward error, and underaward error. Students who received less than was determined to be the correct amount are said to have been "underawarded." Similarly, students who received more than was determined to be the correct amount are said to have been "overawarded."

The sum of the dollar error for all "underawarded" recipients is called the **underaward error**, while the sum for all "overawarded" recipients is called the **overaward error.** Subtracting the value of underaward error from overaward error yields **net error.** This amount represents the estimated payments in error made to students. For most sources of error, net error is a positive number, representing excess cost to the program, because the value of overawards is usually greater than the absolute value of underawards. If underawards exceed overawards, net error is a negative number. Adding the absolute value of underaward error to overaward error yields **absolute error.** This amount represents the sum of the estimated incorrect payments made to students, whether that incorrect payment be an excess or a shortfall.

An attempt also was made to distinguish among institutionally generated error, student-generated error, total error, and case error. **Institutional error** is defined as the difference between a recipient's actual award and the amount the school should have given the student based on the Student Aid Index (SAI) the school had in its files. This reflects the school's incorrect determination of the student's eligibility to participate in the program as well as errors in determining or using the correct cost of attendance and/or enrollment status. **Student error** is defined as the difference between the correct award the student should have received and the award calculated using the application data submitted by the student and the correct cost of attendance

and enrollment status. This reflects the marginal effect on the recipient's award effect caused by errors in the student's application data.

Adding institution error and student error yields **total error.** For some recipients, awards are affected by both student and institutional errors. In many cases, there are compensating errors. For total error, any compensatory effects of student and institutional error are ignored. **Case error** includes the effects of compensatory student and institutional errors. It is defined to be the difference between the award the student received and the award the student should have received using all of the best data available. When the term "error" is used alone in this report, it usually refers to case error.

Each of the types of error defined here can be presented in terms of rate of error and amount of error. Rate of error is simply the **percentage of cases with error.** This percentage is based on the sample but is also the best estimate for the population of Pell recipients. Amount of error can be presented in several different ways. Two types of average error are used throughout this volume. **Mean error per recipient** is the total dollar amount of error divided by the total number of recipients. It provides an average figure for all recipients, with recipients with zero error included in the number of recipients. **Mean error per recipient with error** is the total dollar amount of error divided by the number of recipients with error. It provides an average figure only for those recipients with error, excluding all recipients with zero error. While both measures of average error are derived from the sample, each is a good estimate of error in the population of Pell recipients.

The final error figure used is the **program-wide estimate,** presented in millions of dollars. It is derived by multiplying the mean error per recipient by the estimated number of Pell recipients, 2.53 million. The program-wide estimate also is presented as a percentage of the total value of all Pell awards in 1982-83, approximately $2.4 billion.

2.1.2 Measures of Case/Total Error

Table 2-1 presents a summary of the amounts and rates of error estimated in the Pell Grant program for 1982-83. An estimated 62.7 percent of all recipients had

TABLE 2-1

A SUMMARY OF AMOUNTS AND RATES OF ERROR

ABSOLUTE ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	321	13	127	33.5	379
Student	328	14	129	39.4	328
Total	649	27	256	62.7	408
Case	605	25	239	62.7	381

NET ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	99	4	39	33.5	117
Student	217	9	86	39.4	217
Total	316	13	125	62.7	199
Case	326	13	129	62.7	205

OVERAWARD ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	210	9	83	15.7	528
Student	272	11	108	30.6	351
Total	482	20	190	41.5	459
Case	465	19	184	41.5	444

UNDERAWARD ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	-111	5	-44	17.8	-247
Student	-55	2	-22	8.8	-249
Total	-166	7	-66	21.2	-309
Case	-139	6	-55	21.2	-259

[a] Amount of Pell awards is $2.4 billion for 1982-83.

[b] Error is defined as a discrepancy of plus or minus $2 from the best award.

awards in error by at least $2. Extending this tolerance range to $100 drops the percentage of recipients in error to 42.4 percent. However, the program-wide estimates of error, both in an absolute and net sense, differ only slightly between the $2 and $100 tolerance ranges. This is shown in Table 2-2. The estimated absolute error with a $2 tolerance is $605 million, while with a $100 tolerance it is $577 million. Similarly, estimated net error drops by only 1 percent with the expanded tolerance range.

On average, Pell Grant recipients in 1982-83 received $129 too much (net case error). This represents a net $326 million overaward to the 2.53 million Pell Grant recipients, or 13 percent of the $2.4 billion awarded to students in 1982-83. An estimated 41.5 percent of the recipients were given too large an award. These overawards averaged $444, or a program-wide $465 million in overawards. An estimated 21.2 percent of the recipients were given too little money. These underawards averaged $259, for a program-wide $139 million in underawards.

As Table 2-3 depicts, many of the overawards and underawards were substantial. For example, 14.1 percent of all recipients, an estimated 360,000 students, received over $550 more than they should have, while 3.8 percent of all recipients (96,000 recipients) received over $550 less than they should have.

Table 2-4 depicts the distribution of case error across overawards (both to eligibles and ineligibles) and underawards. Examining the 41.5 percent of recipients who received overawards, 29.8 percent of all recipients received more of a Pell Grant than they should, but still were eligible for some award. However, 11.7 percent of all recipients (approximately 300,000 students) should have received no award. These ineligibles were overawarded by an average of $824 each and contribute more than half of all funds that were overawarded. Ten percent of all program funds went to these ineligibles.

2.2 OVERVIEW OF STUDENT ERROR

The student component of overall error is that which is attributable to discrepancies in Pell Grant application values submitted by students and their parents. Absolute error attributable to students and their parents is roughly equal to absolute

TABLE 2-2

AMOUNTS AND RATES OF ERROR WITH SELECTED TOLERANCE LEVELS OF NO ERROR

	Program-Wide Estimate		Estimated Cases with Error (%)
	Absolute ($ Millions)	Net ($ Millions)	
Case Error ($)			
± 2	605	326	62.7
± 25	598	320	55.8
± 50	591	318	49.7
± 100	577	316	42.4
Student Error ($)			
± 2	328	217	39.4
± 25	323	212	36.0
± 50	318	209	30.9
± 100	307	207	25.8
Institutional Error ($)			
± 2	321	99	33.5
± 25	318	98	27.5
± 50	315	99	24.9
± 100	307	100	20.6

TABLE 2-3

PERCENTAGE OF CASES WITH ERROR BY DOLLAR RANGE

Dollar Range	Case Error (%)	Case Error Treating Cases with SEP/FAT/Invalid SAR Errors as Eligible (%)
551 and more	14.1	11.2
251 to 550	8.4	8.4
151 to 250	5.1	5.2
101 to 150	3.2	3.3
51 to 100	4.3	4.5
26 to 50	4.4	4.5
3 to 25	1.7	1.8
- 2 to 2	37.3	39.0
- 3 to - 25	1.9	1.9
- 26 to - 50	2.7	2.7
- 51 to - 100	3.1	3.3
- 101 to - 150	2.2	2.3
- 151 to - 250	3.1	3.2
- 251 to - 550	4.7	4.8
- 551 and less	3.8	3.9

TABLE 2-4

A SUMMARY OF AMOUNTS AND RATES OF OVERAWARD AND UNDERAWARD

	Case Overaward			Case Underaward
	All	Eligibles	Ineligibles	
Program-Wide Estimate ($ Millions)	465	220	244	- 139
Mean Error per Recipient with Error ($)	444	290	824	- 259
Percentage of Cases with Error Greater Than $2	41.5 %	29.8 %	11.7 %	21.2 %
Error as a Percentage of Dollars Awarded	19 %	9 %	10 %	6 %

error attributable to schools and thus comprises about one-half of the program-wide absolute error reviewed in the previous section. However, the ratio of overawards to underawards is substantially higher for student error than institutional error. Therefore, net error associated with students is roughly twice the net error attributable to schools, comprising about two-thirds of program-wide net error. In Chapter 4, a detailed examination of student error and its component parts is presented. In this overview section, the types of student error are defined and highlights of the findings for 1982-83 are presented.

2.2.1 Types of Student Error

Student error is defined as the difference between what the recipient's award should have been using correct student and institutional data and what the award would be using correct institutional data but the student data as reported on the recipient's application. Effectively, for any student, it is the error attributable to discrepancies in application values as measured on the application that was the basis for the student's award determination.

An examination was also made of the **marginal contributions** of each data element on the application to student error. The marginal contribution of a data element was calculated for each student by first determining the amount the student would have received using the correct institutional data and the student data reported on the application. Then this determination was repeated except that the "best value" of the data element in question was substituted for student-reported value of that data element. The marginal error contribution of the data element was then set equal to the difference between these two amounts. Thus, each marginal student error is a measure of the affect on award of a student's reporting that particular data element incorrectly.

2.2.2 Measures of Student Error

Table 2-1 shows that net student error averaged $86 per recipient for a total program-wide net student error of $217 million (9 percent of Pell Grant dollars awarded in 1982-83). The $217 million was the net overaward resulting from $272 million in overawards to 30.6 percent of the recipients (770,000 students) and $55

million in underawards to 8.8 percent of the recipients (220,000 students). Thus, nearly one million students (39.4 percent of the Pell Grant recipients in 1982-83) had application errors resulting in $2 or more of award error each and totaling $328 million.

The second panel of table 2-2 displays the effect of changing the $2 tolerance on the amount of student error and the percentage of cases with error. As can be seen, if error is defined as only those cases where application form discrepancies result in award errors in excess of $100, student error was estimated to occur in only 25.8 percent of the cases (650,000 students). However, when the error tolerance is increased from $2 to $100 the program-wide estimates of error decreased by only 5.5 percent and 2.8 percent for absolute and net errors, respectively.

The greatest contributor to student error was found to be the incorrect classification of a student's dependency status. An estimated 5.1 percent (129,000) of all recipients originally awarded as independent students were determined actually to be dependent, while .4 percent (10,000) of all recipients initially awarded as dependent students were determined to be independent. The effect of these incorrect classifications was an estimated $64 million in both net and absolute overpayments.

The second greatest contributor to student error was the incorrect reporting of "Other Nontaxable Income." This data element includes child support, the untaxed portion of unemployment compensation, the interest/dividend exclusion, and other welfare (excluding AFDC) benefits, among other items. The estimated marginal effect of discrepancies in this data item was $46 million in overpayments. Other major contributors to student error were discrepancies in reporting household size, number in postsecondary education, home equity, dependent student's (and spouse's) income and assets, and adjusted gross income of independent students and parents of dependent students.

2.3 OVERVIEW OF INSTITUTIONAL ERROR

Institutional error is defined as the difference between the award that

the school gave the student and what the award should have been, given the student's SAI (regardless of whether the student's application data were correct) and the rules and regulations governing the Pell Grant program. In Chapter 3, a detailed presentation of institutional error is given. In this section, the components of institutional error are defined and estimates are given for 1982-83.

2.3.1 Types of Institutional Error

Institutional error is decomposed into two parts: **eligibility error** and **disbursement error**. Eligibility error occurs when a recipient is ineligible for an award due to noncompliance with one or more of twelve regulatory criteria. Disbursement error occurs when a student receives the wrong amount of award due to calculation or accounting mistakes on the part of the institution or the use of an incorrect cost of attendance or enrollment status for the student.

Eligibility error can only be an overaward since it is defined as giving an award to a student who should not have received one. As a result, the net and absolute eligibility errors are equal. Disbursement error includes overawards and underawards, so net error is less than absolute error. As will be shown, the absolute dollar value of underawards due to disbursement error actually exceeded overawards due to disbursement error in 1982-83.

2.3.2 Measures of Institutional Error

Table 2-1 shows that an estimated 15.7 percent of Pell Grant recipients for 1982-83 were overawarded and 17.8 percent were underawarded due to institutional error. However, the mean overaward exceeded the mean absolute underaward by more than two to one. This is because overawards are usually eligibility errors, which means that student's entire grant is in error. As a result, net program-wide institutional error was positive, and equal to $99 million or an average $39 overaward per recipient. Absolute error, the sum of overawards and underawards, totaled $321 million and averaged $127 per recipient.

Table 2-5 presents a breakdown of the components of institutional error. An estimated 5.2 percent of all Pell Grant recipients (an estimated 130,000 students)

TABLE 2-5

COMPONENTS OF INSTITUTIONAL ERROR

	ABSOLUTE ERROR				NET ERROR		
	Mean Error per Recipient ($)	Mean Error per Recipient W/Error ($)	Program-Wide Estimate ($ Millions)	Cases W/Error (%)	Mean Error per Recipient ($)	Mean Error per Recipient W/Error ($)	Program-Wide Estimate ($ Millions)
Eligibility Error	56	1,078	142	5.2	56	1,078	142
Insufficient Program Length	*	79	.1	.03	*	79	.1
Nondegree Program	5	1,051	13	.49	5	1,051	13
Not Parent Institution	2	1,018	5	.21	2	1,018	5
Default on Loan	*	505	.4	.03	*	505	.4
Less Than Half Time	*	601	1	.09	*	601	1
Unsatisfactory Academic Progress	2	656	6	.38	2	656	6
Invalid SAR	3	855	8	.36	3	855	8
No Statement of Educational Purpose	4	1,043	10	.39	4	1,043	10
No Financial Aid Transcript	37	1,168	95	3.2	37	1,168	95
No SAR in File	2	1,725	4	.10	2	1,725	4
Has Bachelor's Degree**	--	--	--	--	--	--	--
Not a Citizen or Eligible Noncitizen**	--	--	--	--	--	--	--
Disbursement Error	77	255	195	30.2	-15	-50	-38
Cost of Attendance Error	19	180	49	10.8	-8	-76	-21
Enrollment Status Error	58	260	147	22.3	-16	-71	-39
Calculation/Accounting Error	22	182	57	12.3	9	77	24

*Less than $1.

**There were no instances of these errors in the sample used.

should have been ineligible for any award due to noncompliance with one or more of the twelve eligibility criteria listed. Clearly the largest group, "No Financial Aid Transcript (FAT)," dominates the causes of ineligibility, exceeding the next most frequent cause by almost seven to one. Other than FAT error, very little discrepancy based upon general eligibility requirements was found.

The value of disbursement error underawards exceeded overawards and an estimated net $38 million in disbursement underaward error occurred in 1982-83. This occurred because institutions generally understated cost of attendance or enrollment status. More than one-fifth (22.3 percent) of all recipients received awards based, in part, on the wrong enrollment status, while 1 in 10 received awards based on the wrong cost of attendance.

2.4 EFFECT OF FAT/SEP/INVALID SAR ERRORS

As shown in Table 2-5, the lack of a Financial Aid Transcript (FAT) on file for a transfer student was the largest factor of the eligibility error component of institutional error. Error associated with the absence of a FAT, lack of a signed Statement of Educational Purpose (SEP), or use of an invalid Student Aid Report (SAR), such as a photocopy, is different from the error associated with the other nine criteria. The first three are failures to follow procedure and are indicators of potential error. The last nine are matters of fact that make the student ineligible. In this section, an overview of the effects on error of ignoring FAT, SEP, and Invalid SAR error is presented.

Table 2-6 is analogous to Table 2-1 except that errors relating to a missing FAT, a missing SEP, and not having a valid SAR on file were ignored. Program-wide net case error dropped from the estimated $326 million overpayment reported earlier to $226 million overpayment. This drop of $100 million may be considered the marginal impact of FAT/SEP/Invalid SAR error. In all, net institutional error dropped $112 million from an estimated $99 million in overaward to $13 million in underaward. However, net student error increased by $14 million. This was because students with application error, but who had institution-based eligibility error were, by the definition of student error, not included in the student error total. When FAT/SEP/Invalid SAR error was ignored, students who had both FAT/SEP/Invalid SAR error and application data error contributed to the student error calculations.

TABLE 2-6

A SUMMARY OF AMOUNTS AND RATES OF ERROR
TREATING CASES WITH SEP/FAT/INVALID SAR ERRORS AS ELIGIBLE

ABSOLUTE ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	217	9	86	30.6	281
Student	345	14	137	41.1	332
Total	562	23	223	61.1	364
Case	517	21	204	61.1	334

NET ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	-13	.5	-5	30.6	-17
Student	231	10	91	41.1	222
Total	217	9	84	61.1	141
Case	226	9	89	61.1	146

OVERAWARD ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	102	4	40	12.2	331
Student	288	12	114	32.0	355
Total	390	16	154	39.1	394
Case	371	15	147	39.1	375

UNDERAWARD ERROR

Error	Program-Wide Estimate ($ Millions)	Program-Wide Estimate (% of $ Awarded)[a]	Mean Error per Recipient ($)	Cases W/Error[b] (%)	Mean Error per Recipient W/Error ($)
Institutional	-115	5	-46	18.4	-248
Student	-57	2	-23	9.1	-250
Total	-173	7	-68	22.0	-310
Case	-145	6	-57	22.0	-261

[a]Amount of Pell awards is $2.4 billion for 1982-83.

[b]Error is defined as a discrepancy of plus or minus $2 from the best award.

Overall, an estimated 61 percent of all recipients had award error in excess of $2 when FAT/SEP/Invalid SAR error was ignored. An estimated 42.3 percent of all recipients had award error in excess of $100. Further, as shown in Table 2-3, 11.2 percent (260,000 students) had overawards in excess of $550.

Unless explicitly stated otherwise, a missing FAT or SEP, or an invalid SAR is considered to be an error and the recipient is deemed ineligible throughout the remainder of this report. Thus, most subsequent findings are based on the assumption that procedural errors make a recipient ineligible, as required by the current regulations.

2.5 CONCLUSIONS

The findings which are overviewed in this chapter have the following implications.

- Since one-in-five program dollars were misallocated, the need for corrective actions remains.
- Categorical eligibility errors occurred with a low incidence and indicate less need for corrective actions.
- Institutional disbursement errors were generally underawards; however, the magnitudes of these errors require prompt attention.
- Student error, which was predominantly overawarding error, accounted for more than 60 percent of total absolute error.
- Problems with incorrect dependency status were the major source of student error.

CHAPTER 3
INSTITUTIONAL ERROR

This chapter presents estimates of institutional error in the Pell Grant program for 1982-83. Institutional error is evaluated in terms of the component parts and possible causes. Significant findings presented in this chapter include:

- With the exception of a lack of a Financial Aid Transcript (FAT) being on file, institution-related eligibility error was very rare (under 2 percent of all cases).
- Disbursement error occurred in over 30 percent of all cases. Disbursement error was composed of cost of attendance error (11 percent error rate), enrollment status error (22 percent error rate), and calculation/accounting error (12 percent error rate).
- Eligibility error (primarily lack of an FAT) resulted in overawards totaling an estimated $142 million. Disbursement error, however, resulted in a net underaward of $38 million.
- Excluding SEP/FAT/Invalid SAR error resulted in net program-wide institutional error of $-13 million. That is, institutional error resulted in students receiving $13 million less than they were entitled to receive.
- Error rates differed significantly across institutional control and type with proprietary schools having generally higher propensities to make an error. Clock-hour, term-type, and credit measurement schools, which are overwhelmingly proprietary, also exhibited higher error rates.
- Institutional characteristics other than type, control, term type, and credit measurement type were not good explanations of causes of error.

3.1 NATURE AND TYPES OF INSTITUTIONAL ERROR

In Chapter 2 institutional error was defined as the difference between the Pell Grant recipient's actual award and the amount the school should have given the student with the Student Aid Index (SAI) the school had in its files. In this section we refine this definition to include the component parts of institutional error.

There are two major types of institutional error as depicted in Figure 3-1. Eligibility error occurs when a recipient is ineligible for an award due to noncompliance with one or more of the twelve criteria shown in Figure 3-1. We have operationally defined eligibility error as the amount of the award received by the student, assuming that the institution calculated the award correctly using the information available to it. As is the case for other eligibility errors, eligibility error due to a missing FAT is defined as the entire amount disbursed. Since schools are allowed to make a first disbursement without a transfer student's FAT, this definition of error includes some portion--that after the first disbursement--for which there is no institutional liability.

The eligibility errors, along with their definitions, are listed below.

- Insufficent Program Length--The student's academic program must be at least six months in duration.
- Nondegree Program--The student's academic program must lead to a certificate or associate, bachelor's, or undergraduate professional degree.
- Not Parent Institution--The Pell Grant disbursement for a student attending consortium programs must be made by the student's parent institution.
- Default on Loan--No student may receive a Pell Grant if in default on a Guaranteed Student Loan or a National Direct Student Loan awarded by that school or in default on a repayment agreement for any Title IV program from that school.
- Less Than Half Time--The student must be enrolled at least one-half time in an eligible program.
- Unsatisfactory Academic Progress--The student must be meeting the school's own criteria for satisfactory progress.
- Invalid Student Aid Report (SAR)--The school must keep an original of the most current Student Aid Report on file.
- No Statement of Educational Purpose (SEP)--The student must sign a SEP indicating the intent to use the Pell Grant for education-related purposes and the school must keep the copy on file.
- No Financial Aid Transcript (FAT)--The school may not make a second disbursement of Pell Grant funds to a transfer student without receiving a FAT from the school from which the student transferred.
- No SAR in File--The school must have a SAR for all Pell Grant recipients.

INSTITUTIONAL ERROR

Eligibility Error

- Insufficient Program Length
- Nondegree Program
- Not Parent Institution
- Default on Loan or Payment
- Less Than Half Time
- Unsatisfactory Academic Progress
- Invalid SAR
- No Statement of Educational Purpose
- No Financial Aid Transcript
- No SAR in File
- Possession of Bachelor's Degree
- Not a U.S. Citizen or Eligible Non-citizen

Disbursement Error

- Cost of Attendance Error
- Enrollment Status Error
- Calculation/Accounting Error

FIGURE 3-1

THE COMPONENTS OF INSTITUTIONAL ERROR
IN THE PELL GRANT PROGRAM

- Possession of Bachelor's Degree--The student may not already have a bachelor's (or equivalent) degree.
- Not a U.S. Citizen--Students must be U.S. citizens or eligible non-citizens.

Disbursement error occurs when a student receives the wrong amount of award due to mistakes on the part of the institution in determining cost of attendance or enrollment status, calculating the award amount, or accounting for disbursement activity as defined by the Pell Grant program. Thus, disbursement error can be reported as a whole--the difference between the amount disbursed and the amount of the award calculated using the best values for cost of attendance and enrollment status and the values known to the institution for all student variables, assuming the student is eligible--or broken down into its three component parts. These component parts are listed in Figure 3-1. The sum of the errors for the parts is not the same as the whole because the formulas used for each part isolate its error and do not properly capture interactions with the other parts.

We have used best values for the complete academic year in determining cost of attendance and enrollment status errors. There is, however, nothing in the current regulations requiring continued monitoring of cost of attendance and enrollment status by the institutions as long as their initial figures were reasonable at the time the expected disbursement was determined. We are using the approach indicated because it is the only way to arrive at uniform and consistent estimates of error, even though some part of each error may not result in institutional liability.

3.2 INSTITUTIONAL ERROR FINDINGS

Table 3-1 summarizes institutional error for 1982-83. Overall, an estimated 33.5 percent (845,000) of all Pell Grant recipients had incorrect awards due to institutional error. The likelihood of an underaward error (17.8 percent) slightly exceeded that for an overaward error (15.7 percent), but the average overaward was more than twice the size of the average underaward. As a result, overawarded dollars exceeded underawarded dollars by an estimated $99 million or $39 per Pell Grant recipient. This net overaward equaled approximately 4 percent of program expenditures for 1982-83.

TABLE 3-1

AMOUNTS AND RATES OF INSTITUTIONAL ERROR

	Absolute Institutional Error	Net Institutional Error	Institutional Overaward	Institutional Underaward
Program-Wide Estimate ($ Millions)	321	99	211	-111
Mean Error per Recipient ($)	127	39	83	-44
Mean Error per Recipient with Error ($)	379	117	528	-247
Percentage of Cases with Error Greater Than $2	33.5 %	33.5 %	15.7 %	17.8 %
Error as a Percentage of Dollars Awarded	13 %	4 %	9 %	5 %

The range of institutional error is shown in Table 3-2. From this table it can be seen that more than 22 percent of the recipients had institutional error (overawards or underawards) in excess of $100. Also, 6.8 percent (170,000 students) had overawards in excess of $550 and 3.5 percent (90,000 students) were underawarded in excess of $550.

The second column of Table 3-2 lists the range of error when the lack of a SEP, FAT, or a valid SAR on file at the school is not considered an error. Dropping these eligibility criteria decreases the proportion of recipients with institutional error to 30.6 percent, or 775,000 students, and significantly decreases the number of the cases with large overawards. Table 3-3 replicates Table 3-1 excluding SEP/FAT/Invalid SAR error. The effect of dropping the large overawards associated with these three eligibility errors is to drive net institutional error to an insignificant level, a negative $13 million. However, institutional error still exists, as shown in the $217 million absolute sum of overawards and underawards.

3.2.1 Eligibility Errors

Eligibility error can only result in an overaward since it is defined as giving an award to a student who should not have received one. Table 3-4 displays the levels, frequencies, and payment consequences of each type of eligibility error. The sum of the components of eligibility error is very slightly greater than the overall eligibility error because almost 2 percent of the cases have more than one eligibility error.

It is clear that with the exception of no FAT on file, institution-related eligibility error is nearly inconsequential in the Pell Grant program. In total, eligibility criteria other than the FAT were not satisfied in fewer than 50,000 cases (2 percent) and resulting dollar error was under $50 million. The last two criteria--bachelor's degree and citizenship--were always satisfied for the sample of recipients. Given the low frequency of each component it is a good presumption that schools are generally doing a good job in ensuring compliance with the regulations regarding eligibility. The lack of a Financial Aid Transcript is somewhat more of a problem and is explored further elsewhere in this findings report and in Volume 2, Corrective Actions.

TABLE 3-2

PERCENTAGE OF CASES WITH INSTITUTIONAL ERROR BY DOLLAR RANGE

Dollar Range	Institutional Error (%)	Institutional Error Treating SEP/FAT/Invalid SAR Cases as Eligible (%)
551 and more	6.8	3.3
251 to 550	2.3	2.1
151 to 250	1.4	1.3
101 to 150	1.0	0.9
51 to 100	1.8	1.8
26 to 50	1.4	1.5
3 to 25	1.2	1.2
- 2 to 2	66.5	69.4
- 3 to - 25	2.8	2.9
- 26 to - 50	2.4	2.4
- 51 to - 100	1.9	2.0
- 101 to - 150	1.8	1.9
- 151 to - 250	2.2	2.3
- 251 to - 550	3.3	3.4
- 551 and less	3.5	3.6

TABLE 3-3

AMOUNTS AND RATES OF INSTITUTIONAL ERROR
TREATING CASES WITH SEP/FAT/INVALID SAR ERRORS AS ELIGIBLE

	Absolute Institutional Error	Net Institutional Error	Institutional Overaward	Institutional Underaward
Program-Wide Estimate ($ Millions)	217	-13	102	-115
Mean Error per Recipient ($)	86	-5	40	-46
Mean Error per Recipient with Error ($)	281	-17	331	-248
Percentage of Cases with Error Greater Than $2	30.6 %	30.6 %	12.2 %	18.4 %
Error as a Percentage of Dollars Awarded	9 %	.5 %	4 %	5 %

TABLE 3-4

THE COMPONENTS OF ELIGIBILITY ERROR

	Cases With Error			
	% Of All Recipients	Number	Mean Error per Recipient ($)	Program-Wide Error Estimate ($ Millions)
Insufficient Program Length	0.03	1,000	79	0.1
Nondegree Program	0.49	12,400	1,051	13
Not Parent Institution	0.21	5,200	1,018	5
Default on Loan	0.03	1,000	505	0.4
Less than Half Time	0.09	1,600	601	1
Unsatisfactory Academic Progress	0.38	9,100	656	6
Invalid SAR	0.36	9,300	855	8
No SEP	0.39	9,800	1,043	10
No FAT	3.20	81,000	1,168	95
No SAR in File	0.10	2,400	1,725	4
Not a Citizen	0.0	0	0	0
Possess Bachelor's Degree	0.0	0	0	0
Overall Eligibility Error	5.20	130,000	1,078	142

3.2.2 Disbursement Error

Disbursement error was much more common than eligibility error, occurring in 30 percent of all cases. Table 3-5 is a display of the level, frequency, and payment consequences of the components of disbursement error. Both the frequency and overall value of underawards exceeded overawards, so that in balance disbursement error resulted in those recipients with disbursement error receiving $50 too little, on average.

Enrollment status error was the most frequent disbursement error and generally resulted in underawards. As shown in the bottom panel of Table 3-6, enrollment status error was more than twice as likely to result in an underaward than an overaward. Thus, schools tended to understate the enrollment status of recipients (i.e., to award on the basis of the student being enrolled for fewer credits than was actually the case).

While the net cost of attendance error was negative (underaward), approximately the same number of recipients received erroneous overawards as received erroneous underawards. In 1 percent of all cases (25,000 students) a school's understating a recipient's cost of attendance resulted in that student's receiving at least $550 less than he or she should have.

Calculation/accounting error generally led to students' receiving more than they should have. In cases with this error, the average student received $77 more than he or she should have. In all, an estimated $24 million too much was awarded because of calculation/accounting error.

Overall, disbursement error was more likely to result in an underaward as compared to an overaward and generated a net $38 million decrease from what should have been awarded to students in 1982-83.

3.3 EVALUATION OF POSSIBLE CAUSES OF ERROR

We presented program-wide estimates for institutional error and its major components in the previous section. Examining differences in the level and frequency of these errors across institutional types, procedures, and practices can provide information about the possible causes of these errors.

TABLE 3-5

THE COMPONENTS OF DISBURSEMENT ERROR

	Cases With Error			Program-Wide Error Estimates	
	% of all Recipients	Number	Net Mean Error ($)	Absolute Error ($ Millions)	Net Error ($ Millions)
Disbursement Error	30.2	764,000	-50	195	-38
Cost of Attendance Error	10.8	273,000	-76	49	-21
Enrollment Status Error	22.3	564,000	-71	147	-39
Calculation/ Accounting Error	12.3	311,000	77	57	24

TABLE 3-6

PERCENTAGE OF CASES WITH DISBURSEMENT ERROR BY DOLLAR RANGE

Dollar Range	Total Disbursement Error (%)	Cost of Attendance Error (%)	Enrollment Status Error (%)	Calculation/ Accounting Error (%)
551 and more	2.7	.3	1.7	1.0
251 to 550	1.9	.5	1.7	1.2
151 to 250	1.2	.4	.9	1.1
101 to 150	1.0	.3	.9	1.1
51 to 100	1.9	1.1	1.0	1.2
26 to 50	1.4	1.7	.4	.9
3 to 25	1.3	.5	.5	.9
-2 to 2	69.8	89.2	77.7	87.7
-3 to -25	2.9	.7	1.5	1.1
-26 to -50	2.5	1.4	1.8	.7
-51 to -100	2.2	.8	1.8	1.1
-101 to -150	1.9	.6	2.0	.5
-151 to -250	2.4	.3	2.1	.5
-251 to -550	3.3	1.1	3.5	.7
-551 and less	3.5	1.0	2.5	.3
Summary				
Overawards	11.4	4.8	7.1	7.4
No Error (± $2)	69.8	89.2	77.7	87.7
Underawards	18.7	6.0	15.2	4.9

Two analysis methods were utilized to perform a causal analysis: simple bivariate tables and multivariate regressions. Before we discuss the results (in Sections 3.3.2 and 3.3.3) we present an enumeration of possible causes in the next section (3.3.1).

3.3.1 Enumeration of Possible Causes

Since the purpose of the causal analysis is to support the development of management corrective actions, it is necessary to characterize the possible factors which explain differences in error rates as discretionary or intrinsic. Intrinsic factors are characteristics which can not be influenced or altered as part of management action. Intrinsic factors would include organizational constraints, characteristics of the population served, and environmental or background considerations. Discretionary factors would include variables which describe the system, process features used in administering the Pell Grant program, and indicators of management practices. Table 3-7 is a listing of the institutional characteristics which we reviewed as potential causes in the following two sections. This list is restricted to variables which meet two conditions:

- The variable must exhibit sufficient variation across the institutions in the sample.
- The variable must be expected to be a cause of one or more of the six components or measures of institutional error.

This first condition is an objective criterion. The second criterion is more subjective since we are hypothesizing whether or not a relationship is likely to exist.

3.3.2 Simple Bivariate Causal Analysis

In this section we examine the error rates (cases with error, cases with overaward errors, and cases with underaward error) for the following six error measures:

- Overall institutional error
- Eligibility error
- Disbursement error
- Cost of attendance error

TABLE 3-7

INSTITUTIONAL CHARACTERISTICS USED TO ANALYZE POSSIBLE CORRELATES OF ERROR

Characteristics
Intrinsic
Type of Institution
Control of Institution
Term Type
Credit Measurement System
Number of Recipients as Ratio of Enrollment
Administrative System
Discretionary
Method of Disbursement
Frequency of Disbursement
Method of Award Calculation
Performance of Own Validation
Frequency of Award Recalculation
Routine Reverification of Award Calculation
Personnel Used for Award Calculation

- Enrollment status error
- Calculation/accounting error.

The institutional characteristics enumerated in Table 3-7 were tested to determine whether they could explain variation in error rates across institutions and thus be considered as possible causes of these errors. Not all institutional characteristics were examined as possible causes for all error measures. Rather we selected those combinations we thought were most likely to show relationships. Our decisions were based on our experience with the early Pell studies, knowledge of the delivery system, and an understanding of the Pell Grant award determination process. The possible causes of institutional error due to intrinsic and discretionary institutional characteristics are discussed separately.

Intrinsic Characteristics

Table 3-8 displays rates of institutional error across the six categories of institutional type and control. The differences in the proportion of cases with error are statistically significant. Overall 33.5 percent of the cases had institutional error, about 16 percent with overawards and 18 percent with underawards. Proprietary schools had error rates of over 50 percent, with 2-year schools showing more overawards and less than 2-year schools showing more underawards. The two categories of 4-year schools had error rates of about 28 and 22 percent, making them the least error-prone of the six categories. While public 4-year schools had nearly equal overawards and underawards, such was not the case for private, 4-year schools where there were 1.6 overawards for each underaward. Of particular importance would be the high error rate (46 percent) for public 2-year schools because they account for such a significant proportion (24 percent) of the recipient universe.

Table 3-9 examines the frequency of eligibility error across the six type and control categories. The overall rate of error was 5.2 percent with four of the categories fairly close to this overall rate. The two exceptions were the two proprietary school categories where eligibility error rates exceeded 11 percent.

The pattern which emerges from these two tables, i.e., proprietary schools had more error, is also true for disbursement error (Table 3-10), enrollment status error (Table 3-11) and calculation and accounting error (Table 3-12). With the exception of

TABLE 3-8

PERCENTAGE OF CASES WITH INSTITUTIONAL ERROR BY TYPE AND CONTROL OF INSTITUTION

Type and Control	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Public 4 Year	28.3	14.8	13.5
Public 2 Year	45.5	17.1	28.5
Private 4 Year	21.8	13.6	8.3
Private 2 Year	33.5	7.2	26.3
Proprietary 2 Year	51.5	28.5	23.0
Proprietary Less Than 2 Year	56.7	23.2	33.5
All Institutions	33.5	15.7	17.8

*Chi square = 174.201, df = 5, p = .0001, for error/no error.

TABLE 3-9

PERCENTAGE OF CASES WITH ELIGIBILITY ERROR BY TYPE AND CONTROL OF INSTITUTION

Type and Control	Cases W/Error* (%)
Public 4 Year	5.1
Public 2 Year	2.6
Private 4 Year	5.9
Private 2 Year	3.3
Proprietary 2 Year	11.5
Proprietary Less Than 2 Year	14.4
All Institutions	5.2

*Chi square = 49.541, df = 5, p = .0001, for error/no error.

TABLE 3-10

PERCENTAGE OF CASES WITH DISBURSEMENT ERROR BY TYPE AND CONTROL OF INSTITUTION

Type and Control	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Public 4 Year	24.4	10.4	14.0
Public 2 Year	44.8	15.2	29.5
Private 4 Year	16.9	8.3	8.6
Private 2 Year	30.2	3.9	26.3
Proprietary 2 Year	47.7	21.6	26.2
Proprietary Less Than 2 Year	52.5	11.5	40.9
All Institutions	30.2	11.4	18.7

*Chi square = 276.092, df = 5, p = .0001, for error/no error.

TABLE 3-11

PERCENTAGE OF CASES WITH ENROLLMENT STATUS ERROR BY TYPE AND CONTROL OF INSTITUTION

Type and Control	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Public 4 Year	18.4	4.9	13.5
Public 2 Year	30.4	8.8	21.7
Private 4 Year	14.7	7.3	7.5
Private 2 Year	11.4	3.8	7.6
Proprietary 2 Year	46.1	23.6	22.5
Proprietary Less Than 2 Year	40.4	10.7	29.7
All Institutions	22.3	7.1	15.2

*Chi square = 145.537, df = 5, p = .0001, for error/no error.

TABLE 3-12

PERCENTAGE OF CASES WITH CALCULATION/ACCOUNTING ERROR BY TYPE AND CONTROL OF INSTITUTION

Type and Control	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Public 4 Year	11.2	8.0	3.2
Public 2 Year	14.2	9.1	5.1
Private 4 Year	6.9	5.0	1.9
Private 2 Year	20.9	6.1	14.8
Proprietary 2 Year	22.5	3.7	18.8
Proprietary Less Than 2 Year	23.7	5.9	17.7
All Institutions	12.3	7.4	4.9

*Chi square = 59.56, df = 5, p = .0001, for error/no error.

calculation and accounting error, public 2-year schools were the next most error-prone schools.

A different pattern emerges for cost of attendance error (Table 3-13). Because of their high costs of attendance (usually above the Pell maximum of $3,600), errors in cost of attendance rarely had payment consequences for proprietary schools or private 4-year schools. The likelihood of cost of attendance error was highest for public 2-year schools, followed by private 2-year and public 4-year schools.

A second intrinsic institutional characteristic, term type, is examined in Table 3-14. The differences in rates of error by term type are statistically significant for four of the five error measures, cost of attendance being the exception. Clock hour schools always had the highest proportion of cases with error for all five error types. Semester schools generally had error rates lower than the averages for all institutions; however, the differences are small.

Table 3-15 looks at the influence of the credit measurement system, another intrinsic variable, on institutional error. This variable is highly related to term type since credit hour measurement generally aligns with semester, trimester, and quarter term types while clock hour describes both the term type and the credit measurement system. Given the logical relationship between these two intrinsic variables and the findings for term type, it is not surprising to see that clock-hour schools had cases with error twice as often as credit-hour schools. What is most surprising is that the table shows that clock-hour schools were three times as likely to make an underawarding error as credit-hour schools.

The three intrinsic characteristics reviewed so far--type and control of institution, term type, and credit measurement system--have something in common. The common characteristic, that proprietary schools are most likely to be clock-hour schools, makes it hard to separate the independent influences of term type, credit measurement, and type and control. The results indicated that proprietary/clock-hour schools consistently had the highest levels of institutional error. Our data, however, cannot suggest why this may be the case.

TABLE 3-13

PERCENTAGE OF CASES WITH COST OF ATTENDANCE ERROR
BY TYPE AND CONTROL OF INSTITUTION

Type and Control	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Public 4 Year	10.2	5.3	4.8
Public 2 Year	20.4	8.7	11.7
Private 4 Year	1.7	0.2	1.5
Private 2 Year	12.3	0.0	12.3
Proprietary 2 Year	3.7	2.0	1.8
Proprietary Less Than 2 Year	6.2	1.4	4.8
All Institutions	10.8	4.8	6.0

*Chi square = 151.867, df = 5, p = .0001, for error/no error.

TABLE 3-14

PERCENTAGE OF CASES WITH ERROR BY
TYPE OF INSTITUTIONAL ERROR AND TERM TYPE

Term Type	Type of Institutional Error				
	Eligibility[1]	Disbursement[2]	Cost of Attendance[3]	Enrollment Status[4]	Calculation/ Accounting[5]
Semester	4.3	25.8	11.4	18.6	11.3
Clock Hour	13.0	59.3	12.4	38.6	33.2
Trimester/Quarter	6.3	36.8	9.3	29.6	11.3
Other	3.7	38.7	5.8	30.3	18.0
All Institutions	5.2	30.0	10.8	22.3	12.3

[1]Chi square = 25.67, df = 3, p = .0001, for error/no error.

[2]Chi square = 105.69, df = 3, p = .0001, for error/no error.

[3]Chi square = 5.34, df = 3, p = .1482, for error/no error.

[4]Chi square = 71.38, df = 3, p = .0001, for error/no error.

[5]Chi square = 67.76, df = 3, p = .0001, for error/no error.

TABLE 3-15

PERCENTAGE OF CASES WITH INSTITUTIONAL ERROR
BY CREDIT MEASUREMENT SYSTEM

Credit Measurement System	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Credit Hour	31.0	15.9	15.1
Clock Hour	61.0	13.6	47.3

*Chi square = 111.301, df = 1, p = .0001, for error/no error.

An intrinsic characteristic reflecting whether or not the school was an independent or single-campus institution or part of a branch-campus system is examined as a potential explanation of differing error rates in Table 3-16. The differences across administrative structure are not significant for the eligibility error rate. The error rates for the overall institutional and disbursment errors were highest for independent campuses and lower for either type of branch campus structure. This might be reflective of differences in the size of institutions and any resulting economies of scale.

The final intrinsic characteristic, the ratio of Pell recipients to undergraduate enrollment, and its relationship to overall rates of institutional error is shown in Table 3-17. Institutions with fewer than 10 percent of their enrollment receiving Pell grants had the highest overall error rate, 45 percent, with underawards being 3 times as likely as overawards. The proportion of cases with error (column one) was fairly consistent across the other categories of recipient/enrollment ratios, about 30 to 35 percent.

Discretionary Characteristics

We now turn to the discretionary characteristics. Associations between these characteristics and the various error measures may be suggestive of management corrective actions.

While validation is generally thought to focus on student error, we felt that it might have some association with levels of institutional error. However, as Table 3-18 reveals, institutional validation has little meaningful effect (although there is a statistically significant effect for disbursement and cost of attendance errors) on any of the six measures of institutional error, with no difference in excess of 5 percent. Of course, the 1982-83 program year had such high levels of Department-mandated validation that there were relatively few cases that could have been subjected to institutional validation.

Another characteristic thought to be potentially a cause of institutional error is the skill level of the personnel who calculate the amount of the award. Table 3-19 displays the findings for this hypothesis for both disbursement error and

TABLE 3-16

PERCENTAGE OF CASES WITH INSTITUTIONAL ERROR
BY TYPE OF ERROR AND ADMINISTRATIVE STRUCTURE

Type of Administrative Structure	Type of Institutional Error		
	Overall Institutional[1]	Eligibility[2]	Disbursement[3]
Independent Campus	34.8	4.9	31.8
Central Office Reporting for Branch Campus System	30.0	6.3	25.8
Campus-Level Reporting for Branch Campus System	25.7	6.5	19.9

[1]Chi square = 12.41, df = 2, p = .002, for error/no error.

[2]Chi square = 2.46, df = 2, p = .2919, for error/no error.

[3]Chi square = 22.35, df - 2, p = .0001, for error/no error.

TABLE 3-17

PERCENTAGE OF CASES WITH INSTITUTIONAL ERROR BY RATIO OF PELL RECIPIENTS TO UNDERGRADUATE ENROLLMENT

Ratio of Pell Recipients to Undergraduate Enrollment	Cases w/Error* (%)	Cases w/Overaward (%)	Cases w/Underaward (%)
0 - .0999	45.1	11.5	33.5
.1000 - .1999	36.1	17.2	18.9
.2000 - .2999	30.2	14.2	15.9
.3000 - .3999	32.7	16.2	16.5
.4000 - .4999	36.3	11.6	24.7
.5000 +	32.3	19.4	12.9

*Chi square = 23.68, df = 5, p = .0003, for error/no error.

TABLE 3-18

PERCENTAGE OF CASES WITH ERROR BY INSTITUTIONAL VALIDATION FOR VARIOUS TYPES OF INSTITUTIONAL ERROR

Institution Selects Cases for Own Validation	Type of Institutional Error					
	Overall Institutional[1]	Eligibility[2]	Disbursement[3]	Cost of Attendance[4]	Enrollment Status[5]	Calculation/ Accounting[6]
Yes	34.0	4.9	31.0	11.4	22.6	12.8
No	31.4	6.1	26.8	8.4	21.7	10.8

[1]Chi square - 1.74, df = 1, p = .1874, for error/no error.

[2]Chi square - 1.74, df = 1, p = .1875, for error/no error.

[3]Chi square - 4.93, df = 1, p = .0265, for error/no error.

[4]Chi square - 5.28, df = 1, p = .0216, for error/no error.

[5]Chi square - .23, df = 1, p = .6311, for error/no error.

[6]Chi square - 2.12, df = 1, p = .1457, for error/no error.

TABLE 3-19

PERCENTAGE OF CASES WITH VARIOUS TYPES
OF ERROR BY PERSONNEL USED FOR AWARD CALCULATION

Type of Error	Type of Personnel	Cases W/Error (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Disbursement[1]	Professional Only	32.0	12.2	19.8
	Clerical Only	30.0	10.1	20.0
	Both of the Above	29.8	11.7	18.1
	Other	18.9	7.0	11.9
Calculation/ Accounting[2]	Professional Only	12.2	6.9	5.3
	Clerical Only	13.6	9.3	4.3
	Both of the Above	12.6	9.0	3.6
	Other	9.5	5.4	4.1

[1]Chi square = 24.890, df = 3, p = .0001, for error/no error.

[2]Chi square = 3.299, df = 3, p = .3478, for error/no error.

calculation/accounting error. For these two types of institutional error the likelihood of making errors was fairly close whether schools used professionals only, clericals only, or both, averaging about 30 percent for disbursement error and about 11 percent for calculation/accounting error. The "other" category had considerably lower error rates for both types of error but the 10 percent of the cases attending schools responding to the "other" category and the range of responses falling into this category make speculation inappropriate and too risky.

Another discretionary factor relating to the type of personnel used to perform award calculations is the method used to calculate awards. The error rates for schools using manual, automated, or combination calculation methods are displayed in Table 3-20 for disbursement, cost of attendance, enrollment status and calculation/accounting errors. The error rates were fairly similar for the three categories across all four types of institutional error. Only for disbursement error are there significant differences in error by method of award calculation, with automated calculation associated with the lowest error rate.

Whether or not institutions reported routinely reverifying award calculations would be expected to result in improved quality. Table 3-21 shows the test for this hypothesis for disbursement error and calculation/accounting error. The differences in the results for both types of error are so small as to be statistically meaningless.

A final discretionary characteristic dealing with award calculation is the frequency of award recalculation. We would expect that error rates would be lowest when awards are recalculated before each disbursement. Table 3-22 presents tests of this hypothesis for disbursement error and enrollment status error, respectively. While differences do exist, the statistical strength of these differences is fairly low. The findings are also somewhat counterintuitive in that the error rates were higher for the "before each disbursement only" category.

Table 3-23 presents error rates for enrollment status error by whether the school reported checking enrollment status. While enrollment status error was lower for schools checking enrollment status before each disbursement, as would be expected, the size of the difference in error rates is too small to have any statistical validity.

TABLE 3-20

PERCENTAGE OF CASES WITH VARIOUS TYPES OF ERROR BY METHOD OF AWARD CALCULATION

Type of Error	Method of Award Calculation	Cases W/Error (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Disbursement[1]	Manual	32.3	13.2	19.2
	Automated	24.9	8.2	16.7
	Combination	27.0	7.6	19.4
Cost of Attendance[2]	Manual	10.9	4.8	6.1
	Automated	8.5	2.9	5.6
	Combination	12.6	6.7	5.9
Enrollment Status[3]	Manual	22.8	8.1	14.7
	Automated	21.3	6.3	15.0
	Combination	21.9	3.8	18.1
Calculation/ Accounting[4]	Manual	12.4	7.0	5.3
	Automated	13.3	8.3	4.9
	Combination	11.4	8.1	3.3

[1]Chi square = 16.110, df = 2, p = .0003, for error/no error.

[2]Chi square = 5.35, df = 2, p = .0689, for error/no error.

[3]Chi square = .74, df = 2, p = .6906, for error/no error.

[4]Chi square = .891, df = 2, p = .6405, for error/no error.

TABLE 3-21

PERCENTAGE OF CASES WITH VARIOUS TYPES OF ERROR
BY REPORTED ROUTINE REVERIFICATION OF AWARD CALCULATION

Type of Error	Reverification of Award Calculation	Cases W/Error (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Disbursement[1]	Yes	30.4	11.1	19.3
	No	29.2	12.6	16.6
Calculation/ Accounting[2]	Yes	12.1	7.6	4.5
	No	13.3	6.7	6.6

[1]Chi square = .402, df = 1, p = .5260, for error/no error.

[2]Chi square = .734, df = 1, p = .3917, for error/no error.

TABLE 3-22

PERCENTAGE OF CASES WITH VARIOUS TYPES OF ERROR BY FREQUENCY OF AWARD RECALCULATION

Type of Error	Frequency of Award Calculation	Cases W/Error (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Disbursement[1]	Before Each Disbursement Only	34.6	12.8	21.9
	When Enrollment Status Changes Only	26.1	8.2	17.9
	Both of the Above	29.6	13.8	15.8
	Other	29.9	11.7	18.3
Enrollment Status[2]	Before Each Disbursement Only	26.4	8.1	18.2
	When Enrollment Status Changes Only	19.0	4.6	14.4
	Both of the Above	21.9	7.5	14.3
	Other	22.0	8.6	13.4

[1]Chi square = 17.542, df = 3, p = .0005, for error/no error.

[2]Chi square = 15.812, df = 3, p = .0012, for error/no error.

TABLE 3-23

PERCENTAGE OF CASES WITH ENROLLMENT STATUS ERROR BY REPORTED CHECKING OF ENROLLMENT STATUS

Reverification of Award Calculation	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Yes	21.8	6.4	15.3
No	23.7	8.6	15.1

*Chi square = 1.720, df = 1, p = .1897, for error/no error.

Table 3-24 presents our final bivariate test of a discretionary characteristic: the existence of a relationship between disbursement method and disbursement error. Surprisingly, the error rate was highest for schools paying by check but requiring the student to endorse the check over to the institution. The vast majority of schools used the fourth method--crediting the students' account and disbursing any balance by check. Of course the method of disbursement was heavily influenced by the level of attendance, cost, and whether or not the award exceeded the amount the student had to remit to the institution.

The bivariate findings on the relationships between discretionary institutional characteristics and rates of error reveal few meaningful associations. Institutional validation beyond the high levels required by the Department of Education was not associated with reduced error. Of the four discretionary characteristics related to award recalculation, only method of award calculation yielded any meaningful and significant relationships, with disbursement error rates lowest for institutions using automated systems. The personnel used for award calculation, the frequency of award recalculation, and the routine verification of award recalculation had little affect on rates of error. Finally, institutions reporting procedures to check enrollment status showed no significant reduction of related error and method of disbursement was not meaningfully related to disbursement error.

There is one additional institutional characteristic that is not truly discretionary, because it is a response to an externally imposed requirement. This is the burden of validation reported by each institution. Table 3-25 shows the relationship between the reported burden of validation and cases with error. At first glance, the results appear to be counterintuitive; institutions reporting a burden of validation had significantly less error than those not reporting a burden. However, it is possible that those institutions reporting a burden went to greater efforts in validation than those who did not, and that the burden paid off in reduced error.

3.3.3 Multivariate Analysis

The bivariate comparisons in the previous section looked at the relationships between each of several institutional characteristics or variables and one or more of the institutional error measures. This represented a first effort to identify some possible causal explanations for error. While the results of these bivariate analyses

TABLE 3-24

PERCENTAGE OF CASES WITH DISBURSEMENT ERROR BY TYPE OF DISBURSEMENT MADE

Disbursement Method	Cases W/Error (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
1. Check to Student for full amount (only)	35.4	11.1	24.3
2. Check to Student-Endorsed over to Institution (only)	44.5	6.8	37.7
3. Credit to Students account (only)	22.6	12.0	10.6
4. Credit to Account--Balance by Check (only)	32.4	12.7	19.6
Both 1 and 2	18.9	5.0	13.9
Both 3 and 4	25.0	12.5	12.5
Any other combination	28.9	11.4	17.5

TABLE 3-25

PERCENTAGE OF CASES WITH INSTITUTIONAL ERROR
BY REPORTED BURDEN OF VALIDATION

Burden Reported	Cases W/Error* (%)	Cases W/Overaward (%)	Cases W/Underaward (%)
Yes	30.7	14.8	15.8
No	41.4	18.2	23.2

*Chi square = 35.37, df = 1, p = .0001, for error/no error.

have been useful, a second step is needed. Multivariate analysis permits the joint testing of the effects of several institutional characteristics, the independent variables, on error. In theory this makes it possible to explain a greater proportion of the variance contributing to institutional error, assuming that the model chosen is appropriate. We have selected a linear multiple regression model with institutional error as the dependent variable.

Based on the results of our bivariate analyses, which revealed institutional differences in rates of error by type and control of institution, we are conducting separate regression analyses for each type and control of institution (with one exception) and one combining all institutions. Because of the small number of private 2-year institutions, these were combined with proprietary 2-year institutions. Thus, we estimated six models, one for each of the following groups:

- All institutions
- Public 2-year institutions
- Public 4-year institutions
- Private 4-year institutions
- Proprietary under 2-year institutions
- Proprietary or Private 2-year institutions.

The institutional characteristics which were jointly considered in the model as independent variables were:

- Method of disbursement
- Frequency of disbursement
- Payment calculation method
- Institutional validation
- Recalculation of expected disbursement
- Routine reverification of calculations
- Personnel calculating awards
- Whether enrollment status was checked before computing award

- Whether 1982-83 validation caused a burden.

The model related net institutional error for the sample of students falling in each of the categories to the above characteristics.

Table 3-26 presents the results of the regression models, with the type and control of institution in the model indicated in the column headings. All models share the same nine independent variables, shown as row entries. The last row shows the R-squares for each of the six models. This can be interpreted as the proportion of variance in the dependent variable (institutional error) explained by or accounted for by the independent variables included in the model. The maximum possible value of R-square is 1.00. For an exploratory analysis, an R-square of .150 (15 percent of the variance accounted for), as found for private 4-year schools, is considered quite strong. Notice that four of the models accounted for fairly large proportions of the variance. The R-squares for all of the six models are statistically significant.

The first row of the table, labeled **intercept,** is useful in interpreting the remainder of the table. This value is the average error which would be expected for students attending schools with particular institutional procedures. These procedures, shown as **base** responses on Table 3-26, are as follows:

- Method of Disbursement--"other combinations"
- Frequency of Disbursement--"varies by program"
- Payment Calculation Method--"manual"
- Institutional Validation--"yes"
- Recalculate Expected Disbursement--"when enrollment changes"
- Routine Reverification of Calculation--"yes"
- Personnel Calculating Awards--"professional"
- Check Enrollment Status Before Computing Awards--"yes"
- Did 1982-83 Validation Cause a Burden--"yes."

TABLE 3-26

ESTIMATED DIFFERENCES IN AVERAGE NET INSTITUTIONAL ERROR ATTRIBUTABLE TO DIFFERENT INSTITUTIONAL PROCESSES AND METHODS

	All Institutions	Public, 2 Year	Public, 4 Year	Private, 4 Year	Proprietary Under 2 Years	Proprietary or Private, 2 Year
Intercept	-69.2	37.7	-68.3	-55.5	-84.2	136.3
Method of Disbursement	*	*		*	*	*
1. Check to Student, Full Amount, Only	-64.1	-115.3	32.8	N/A	N/A	-1019.5
2. Check to Student/Endorsed Over to School, Only	-104.6	N/A	29.1	-265.1	10.1	-555.6
3. Credit Account, Only	-22.4	N/A	N/A	-102.3	19.9	-717.6
4. Credit Account and Disburse Balance by Check, Only	-18.0	1.0	10.1	-85.2	245.6	-151.4
5. Methods 1 and 2	-8.0	9.7	-6.0	-34.8	496.8	N/A
6. Methods 3 and 4	12.7	9.8	44.3	-76.4	362.4	-393.9
7. Other Combinations	Base	Base	Base	Base	Base	Base
Frequency of Disbursement	*	*		*		*
1. Monthly	-92.2	-195.8	210.3	330.9	-238.0	-115.4
2. Bimonthly	33.3	-32.8	N/A	-108.7	N/A	N/A
3. Quarterly or 3-4 Times per Year	64.9	-19.8	55.0	-23.2	-496.2	Base
4. Once per Term	57.5	60.1	38.2	-28.1	75.2	550.7
5. Varies by Program	Base	Base	Base	Base	Base	N/A
Payment Calculation Method		*				
1. Manual	Base	Base	Base	Base	Base	Base
2. Computerized	-5.9	-97.1	8.4	-42.1	254.2	-604.6
3. Combination	-3.7	-12.1	-0.9	-28.3	243.7	-133.8
Institution Validation		*		*		
1. Yes	Base	Base	Base	Base	Base	Base
2. No	-5.1	64.5	12.0	-59.8	286.2	-357.9

*Indicates that the characteristic is a statistically significant ($p < .05$) predictor of institutional error for the type and control of institution shown in the column heading.

TABLE 3-26 (Continued)

ESTIMATED DIFFERENCES IN AVERAGE NET INSTITUTIONAL ERROR
ATTRIBUTABLE TO DIFFERENT INSTITUTIONAL PROCESSES AND METHODS

	All Institutions	Public, 2 Year	Public, 4 Year	Private, 4 Year	Proprietary Under 2 Years	Proprietary or Private, 2 Year
Recalculate Expected Disbursement	*		*	*		*
1. Before each Disbursement	29.6	20.7	-45.5	9.2	58.6	574.8
2. When Enrollment Changes	Base	Base	Base	Base	Base	Base
3. Both	0.7	41.1	-29.7	-9.6	-128.6	241.6
4. Other	20.4	32.5	-15.9	84.4	N/A	603.1
Routine Reverification of Calculation			*			*
1. Yes	Base	Base	Base	Base	Base	Base
2. No	19.0	2.0	37.6	17.1	N/A	-643.9
Personnel Calculating Awards			*			*
1. Professional	Base	Base	Base	Base	Base	Base
2. Clerical	17.2	49.1	40.0	35.3	N/A	368.7
3. Both	16.8	-20.2	33.7	75.7	N/A	-728.2
4. Other	12.8	34.6	-58.8	31.9	N/A	N/A
Check Enrollment Status Before Computing Award		*		*		*
1. Yes	Base	Base	Base	Base	Base	Base
2. No	-0.2	-90.9	23.9	76.9	N/A	363.1
Did 1982-83 Validation Cause A Burden?		*		*	*	*
1. Yes	Base	Base	Base	Base	Base	Base
2. No	3.5	-65.7	24.1	112	-255.3	350.3
Proportion of Explained Variance (R-squared)	.047	.195	.032	.150	.535	.358

*Indicates that the characteristic is a statistically significant ($p < .05$) predictor of institutional error for the type and control of institution shown in the column heading.

The numerical entries in the table represent the differences in average net error attributable to being in those categories of the variable rather than falling into the base categories. For example, the "all-institutions" model (column one) indicates that students attending schools where a check to the student for the full amount was the only method of disbursement (response #1) had average errors which were $64 lower than students attending institutions which used the base category, "other combinations" (response #7). Thus, the average net error for this group of students was $ -133 ($ -64 plus the intercept of $ -69), assuming that the base category applied for each of the other eight variables. Using the information in this table, the direction and amount of change in error can be derived for numerous combinations of response categories. It should be understood that the results would change if different base categories were used, but the relationships between the response categories for a given variable would remain the same.

Consider another example of this table using the second variable, frequency of disbursement. Students being paid "once per term" (response #4) had average net errors which were $58 higher than for students attending schools where frequency of disbursement varied by program (the base), which worked out to an average net error of $ -11 ($58 less error than the base of $ -69).

Asterisks in the rows containing the names of the variables indicate that the variable has a statistically significant relationship to net institutional error for students attending schools in the group indicated by the column heading.

The intercept row reveals the importance of type and control as an intrinsic explanation for institutional error. The entry in column one for all institutions indicates that the average net institutional error for students falling into the base categories for all variables was $ -69. This value exhibited considerable differences for the different subgroups of institutions, ranging from a positive $136 for 2-year proprietary or private institutions to an average net underaward of $84 for proprietary schools with programs under 2 years. This finding is consistent with the earlier bivariate analysis.

Method of disbursement is statistically important in five of the six type and control categories. The fact that the categorical effects of this variable are important is somewhat muted by the fact that the differences attributable to being

in one category are not consistent across the models. For example, the estimates for the category "credit account, only" (response #3) ranged from about $20 to a negative $718. This is consistent with the bivariate results which were somewhat unclear.

Frequency of disbursement was important in four of the six models. However, the results varied widely across models with estimates for any one payment frequency representing positive and negative differences in average net error from the base category.

Method of payment calculation was only significant once and the estimates were not stable across the six models, with computerized systems having average net errors per student from $605 lower to $254 higher than manual systems.

The results for the remaining six variables were similarly mixed, with some variables being statistically important for some type and control groups and not for other type and control groups. The signs of the estimated differences were both positive and negative for every category of these six variables with one exception: the clerical category for type of personnel used to calculate awards relative to use of professionals as the base. Here, use of clerical personnel to calculate awards resulted in higher errors across all institutional types.

3.4 CONCLUSIONS

Institutional error accounted for about 30 percent of the net cost of Pell program error. It was about equally likely to be an overaward or underaward, but dollar values of overawards exceeded dollar values of underawards by nearly two to one. Major recommendations regarding efforts to reduce institutional error include the following:

- Most of the overawards were due to one procedural eligibility requirement, lack of a Financial Aid Transcript (FAT) for transfer students. With the exclusion of this error and two other minor procedural errors, net institutional error was a modest underaward. A change in the requirement for collecting the FAT, which can have no bearing on the award in any case, would cut approximately 28 percent of all institutional error.

- Other major contributions to institutional error were cost of attendance and enrollment status. These errors were due partly to confusion about the

institution's responsibility for tracking minor changes across the academic year. Clarification of these responsibilities and communication of them to institutions would significantly reduce error.

- On the whole, disbursement errors, including cost of attendance and enrollment status, were underawards. This suggests caution by institutions and their awareness of their own liability, but occurs somewhat at the expense of student entitlements.

- Efforts to isolate the possible causes of error lead to the conclusion that factors intrinsic to the institution, such as type and control, were related to error but that discretionary institutional procedures, which could be changed, were not strongly related to error.

- Proprietary institutions, which are generally clock-hour institutions, had the highest rates of error. This may be related to the greater complexity of award calculation for clock-hour institutions. Four year institutions had the lowest rates of error.

CHAPTER 4
STUDENT ERROR

This chapter presents estimates of student error in the Pell Grant program for 1982-83. Total student error overviewed in Chapter 2 is decomposed into its component parts as a means of attempting to identify the changes in program rules and regulations that might be effective in reducing the occurrence of error. Significant findings presented in this chapter include:

- The 1982-83 Pell Grant program experienced an estimated $217 million in net student error, or $86 per recipient.
- Dependency status error was the largest single form of student error, comprising approximately $64 million in payment consequences.
- The top six forms of student error were not directly verifiable through 1982-83 validation procedures.
- Extensive bivariate analysis indicated that reported income and school of enrollment were the only variables with any noticeable correlation to student error.
- Multivariate analysis indicated that dependent students from higher incomes, smaller families and older, married students were more likely to have overawards of Pell funds due to misreporting of application data.
- Correlation of student error and institutional type and control was confirmed by the multivariate analysis.
- Use of actual tax return data improved the accuracy of adjusted gross income and U.S. taxes paid, but had little apparent affect on other application items.

4.1 NATURE AND TYPES OF STUDENT ERROR

In Chapter 2, student error was defined as the difference between the correct award the student should have received and the award calculated using the application data submitted by the student and the correct cost of attendance and enrollment status. Any errors which might have been made by the institution are factored out in

the determination of student error. Therefore, student error definitions are contingent on definitions of institutional error. As a consequence, estimates of student error differ according to the treatment of students with missing Statements of Educational Purpose (SEPs), Financial Aid Transcripts (FATs), or invalid Student Aid Reports (SARs). For example, if students with SEP/FAT/invalid SAR error are treated as ineligible, any student errors made by this subset of students would be voided by our formula, resulting in slightly lower estimates of student error. However, it can be asserted that students with these institutional errors should be included in student error in order to give a more representative view of student error. This can be accomplished by treating SEP/FAT/Invalid SAR errors as eligible and yields slightly higher estimates of student error. Both of these estimates are presented in parallel wherever it was felt that the analysis required dual treatment, as was done throughout Chapters 2 and 3. When only one set of figures is shown, all students with SEP/FAT/Invalid SAR errors were considered as eligible, unless otherwise noted.

Student error may occur whenever there are one or more incorrect responses to the application questions. (Not all discrepancies in application items have payment consequences. Some discrepancies, for example, are too small to affect the SAI sufficiently to induce payment change. Other discrepancies may change the SAI, but not the award because of the role that cost of attendance plays in award calculation. Discrepancies in asset or debt items may not change the award because a certain amount of equity is protected in the award calculation. All discrepancies are separately discussed in this chapter and are always referred to as discrepancies rather than errors to avoid confusion.) Student error estimates presented so far in this report represent the payment consequences for any and all incorrect responses to application questions. In this chapter we decompose student error by estimating the dollar payment consequences of error for most of the application items. These estimates are usually for a single application item, such as adjusted gross income, household size, etc. However, there are some application items which are best considered together, such as home value and home debt (which become home equity), or the six items determining dependency status.

As noted in Chapter 1, the findings are presented in two primary dimensions:

- The percentage of cases with errors that result in payment consequences in excess of $2

- The payment consequences of the identified errors
  - in absolute terms (sum of all dollar errors)
  - in net terms (overpayments minus underpayments).

In addition, mean error per recipient and mean error per recipient with error are frequently used to illustrate the payment consequences to individual students on average. Mean error per recipient is the sum of student errors divided by the number of students, including those with zero student error. Mean error per recipient with error divides the sum of error by the number of students with either overaward or underaward, excluding students with zero error. Payment error as a percentage of dollars awarded is also cited to show the relative amount of error.

4.2 STUDENT ERROR FINDINGS

Student error is reviewed at three levels, The first two, overall error and individual components of error show payment consequences of error. The third, discrepancies in application items, illustrates prevalence of error without regard to payment consequences.

4.2.1 Overall Student Error

Table 4-1 summarizes the amounts and rates of student error where SEP/FAT/invalid SAR errors cause cases with those errors to be excluded as ineligible applicants. The program-wide dollar estimate of absolute student error was $328 million, comprised of $272 million in overawarded cases and $55 million in underawarded recipients, for a net student error of $217 million. That amount of error averaged $129 per recipient in absolute terms and $86 in net terms.

For recipients with error, the mean was $328 in absolute terms and $217 on a net basis. Overall, nearly 40 percent of all cases were projected to have some form of error with a payment consequence in excess of $2, of which about 31 percent were overawards and 9 percent were underawards. Absolute error as a percentage of dollars awarded was 14 percent. Overaward was 11 percent of the total awarded dollars, while underaward was 2 percent of the total.

TABLE 4-1

AMOUNTS AND RATES OF STUDENT ERROR
TREATING THOSE WITH SEP/FAT/INVALID SAR ERRORS AS INELIGIBLE

	Absolute Student Error	Net Student Error	Student Overaward	Student Underaward
Program-Wide Estimate ($ Millions)	328	217	272	-55
Mean Error per Recipient ($)	129	86	108	-22
Mean Error per Recipient with Error ($)	328	217	351	-249
Percentage of Cases with Error Greater Than $2	39.4 %	39.4 %	30.6 %	8.8 %
Error as a Percentage of Dollars Awarded	14 %	9 %	11 %	2 %

When cases with SEP/FAT/invalid SAR errors were treated as eligible, the amounts and rates of student error increased slightly, by the amount of student error in those cases otherwise excluded. Table 4-2 shows the magnitude of this additional error. As a percentage of dollars awarded, the increase is negligible.

The range of student error is shown in Table 4-3, both with and without SEP/FAT/invalid SAR errors included. More than 60 percent of the cases were within $2 of the correct award when application data were used. None of the ranges in the negative half of the scale had a very high proportion of the cases; underawards were spread fairly evenly among the ranges. At the other end of the scale, however, there were larger proportions of cases with error. The primary significance of the more than 8 percent in the highest range is that it included most cases where the larger application-based awards proved to be entirely in error (reduced to 0) when correct data were used.

4.2.2 The Components of Student Error

While the overall description of student error is useful in identifying the magnitude of error that is taking place, it does little to identify potential causes of that error so that corrective measures can be developed to reduce their incidence. In order to identify the primary causes, it is necessary to decompose student error and determine those elements that are most troublesome, most amenable to corrective measures, and most likely to yield cost-effective results.

The decomposition of student error into the likely dollar effects contributed by each application item is only an estimate because it does not take into account the interactions between items. For example, in an actual case an underreporting of adjusted gross income (AGI) might be totally offset by an equal overreporting of other income and benefits, yielding no net payment consequence, assuming there were no other application item discrepancies. In estimating the separate payment consequences of each application item for this example, there would be net overaward error for AGI and net underaward error for other income and benefits. Therefore, in interpreting the amounts of net student errors due to individual items caution must be used.

TABLE 4-2

AMOUNTS AND RATES OF STUDENT ERROR
TREATING THOSE WITH SEP/FAT/INVALID SAR ERRORS AS ELIGIBLE

	Absolute Student Error	Net Student Error	Student Overaward	Student Underaward
Program-Wide Estimate ($ Millions)	345	231	288	-57
Mean Error per Recipient ($)	137	91	114	-23
Mean Error per Recipient with Error ($)	332	222	355	-250
Percentage of Cases with Error Greater Than $2	41.1 %	41.1 %	32.0 %	9.1 %
Error as a Percentage of Dollars Awarded	14 %	10 %	12 %	2 %

TABLE 4-3

PERCENTAGE OF CASES WITH STUDENT ERROR BY DOLLAR RANGE

Dollar Range	Student Error Treating SEP/FAT/Invalid SAR Cases as Ineligible (%)	Student Error Treating SEP/FAT/Invalid SAR Cases as Eligible (%)
551 and more	8.2	8.7
251 to 550	7.0	7.2
151 to 250	4.6	4.8
101 to 150	2.5	2.6
51 to 100	3.4	3.6
26 to 50	3.8	3.8
3 to 25	1.2	1.3
-2 to 2	60.6	58.9
-3 to -25	0.3	0.3
-26 to -50	1.2	1.2
-51 to -100	1.9	1.9
-101 to -150	0.8	0.8
-151 to -250	1.6	1.6
-251 to -550	1.6	1.7
-551 and less	1.4	1.4

Table 4-4 displays the distribution of error in its component parts, most of which is at the application-item level. A few items are composites of two or more application items. These are dependency status (from the six dependency status questions), and home equity, business/farm equity, and real estate/investment equity (the difference between value and debt for each of the items). With the exception of AGI, the reason for which is footnoted, the components are listed in descending rank order of their net payment consequence or error. The mean net error per recipient in the first column mirrors the program-wide estimates in the third column in terms of descending magnitudes.

There are three factors that affect the values reported for net error per recipient in column one of Table 4-4. First is the frequency of occurrence of the item. For example, most cases have AGI while few cases have elementary/secondary tuition deductions. Second is the frequency of error in the items. Finally, the dollar consequences or the size of the typical error will influence the average error.

Dependency status error was the highest ranked error, averaging over $25 per recipient and $465 per recipient with error for a total of over $64 million. The second most costly type of application error involved the misreporting of other nontaxable income, costing the program about $46 million in 1982-83 and averaging over $19 per recipient and $191 per recipient with error. Household size ranked third, with error averaging nearly $14 per recipient and $140 per recipient with error for a total of $34 million.

The second column shows the mean size of the error for only those cases in error. On that basis, the rank-order sequence of most large error items changed somewhat. The error in student marital status affected the mean award size by -$903, denoting a significant underawarding problem for those cases where it occurred, even though it happened very infrequently. Business/farm equity was the next most serious error when it occurred (although infrequently), affecting the mean award by $474 per case with error. Dependency status error occupied third place, with a mean average error of $465 per case, followed by AFDC/AFC at $403 per case with error and dependent student's/spouse's income at $331 per case with error. The magnitude then fell to -$274 for students' Social Security educational benefits (an error that will disappear in another year because of program changes), $255 for real estate/investment equity, and $191 for other nontaxable income.

TABLE 4-4

STUDENT ERROR BY APPLICATION ITEMS

Application Item	Mean Net Award Error Error Per Recipient ($)	Mean Net Error Per Recipient With Error ($)	Net Program-Wide Estimate ($ Millions)	Rank
Adjusted Gross Income/Dependency Status[1]	--	--	80	-
Adjusted Gross Income	6.70	164.70	16	7
Dependency Status[2]	25.30	465.00	64	1
Other Nontaxable Income	19.23	191.30	46	2
Household Size	14.10	139.80	34	3
Number in Postsecondary Education	9.60	162.60	23	4
Home Equity	7.70	113.10	18	5
Dependent Student's (and Spouse's) Assets	7.10	39.20	17	6
Dependent Student's (and Spouse's) Income	4.90	330.80	12	8
U.S. Taxes Paid	1.00	29.00	2	9
Spouse's/Mother's Earned Income	.90	91.40	2	10
Real Estate/Investment Equity	.70	255.40	2	11
AFDC/ADC	.70	402.80	2	12
VA Educational Benefits	.40	69.10	1	13
Marital Status (Parent)	.40	132.00	1	14
Business/Farm Equity	.30	473.80	1	15
Cash/Savings/Checking	.30	35.90	1	16
Medical/Dental Expenses	.10	11.80	+0	17
Applicant's/Father's Earned Income	-.10	-5.40	-0	18
Elementary/Secondary Tuition	-.30	-44.00	-1	19
Marital Status (Student)	-.30	-903.00	-1	20
Social Security Benefits (Parent)	-1.20	-82.60	-3	21
Social Security Educational Benefits	-7.10	-274.20	-17	22

1 In 1980 - 1981 Adjusted Gross Income/Dependency Status Error were presented together as Adjusted Gross Income (AGI) Error with an explanatory footnote. The rationale for this was that Dependency Status Error represented use of the incorrect AGI and other application values. In the interest of a greater clarity, we are presenting AGI Error and Dependency Status Error separately, since they are, in fact, errors that represent different problems. For purposes of comparison, we have shown the combined AGI/Dependency Status Error for 1982 -1983.

2 Dependency status error is computed in the same way as overall student error (an approach which is more accurate but cannot be used with individual application items). The figure reported here treats dependency status switchers with SEP/FAT/Invalid SAR error as ineligible. If they were considered eligible, dependency status switcher error would be $70 million.

4.2.3 Discrepancies in Application Items

Another way to look at the distribution of student error at the application-item level is by dollar range of discrepancies. Table 4-5 shows that distribution of discrepancies between verified values and application values for selected items for dependent students. Not all discrepancies resulted in payment consequences and some of these discrepancies were well within ED's validation-tolerance levels. Clearly those items that were validated, AGI and U.S. taxes paid, had far less error than non-validated items. About 85 percent of the dependent student cases were within $2 of actual or "best" values on these items and more than 90 percent were within the tolerance level of $300. The accuracy dropped off dramatically for the non-validated items, although 88 percent of the reported values for Social Security educational benefits, 90 percent of the reported values for other nontaxable income, 84 percent for cash, savings, and checking, 74 percent for dependent student income, 92 percent for dependent student assets and 78 percent of parental Social Security income reports were within $500 of the correct values.

Table 4-6 displays similar data for independent recipients. Here the difference between validated and non-validated data was not so clearly apparent. U.S. taxes paid was as accurate as it was for dependent students. The accuracy of adjusted gross income fell off a bit, perhaps from confusion as to what was to be reported, i.e., student aid, gifts, etc. The percentage of cases with other nontaxable income within $2 was greater for independent students, but there was still a good number of cases (16.5%) with error in excess of $500, which in an independent case can make a sizeable difference in the award. Cash, savings, and checking was not a problem item, as 80 percent of the cases were within $50 of the correct value and less than 5 percent were more than $500 discrepant. Misreporting of Social Security educational benefits was a problem in 1982-83, but will disappear as the phase-out of that program is completed. Half of the cases with VA educational benefits had error, nearly all of it greater than $500, making this discrepancy an important source of error for those few students eligible for VA benefits.

Table 4-7 presents some additional information on the rates and amounts of discrepancies between best values and application values for 13 selected high error items. This table provides separate summaries for dependent students (on all 13 items) and independent students (on the 10 applicable items), excluding those recipients

TABLE 4-5

PERCENTAGE OF DEPENDENT STUDENTS WITH DISCREPANCIES
BY DOLLAR RANGE FOR SELECTED APPLICATION ITEMS[1]

Value of Item Discrepancy ($)	Adjusted Gross Income	U.S. Taxes Paid	Social Security Educational Benefits[2]	Other Nontaxable Income[3]	Cash/ Savings Checking	Dependent Student's Assets	Dependent Student's Income	Social Security Benefits (Parent)[2]
10,001 and more	1.1	0	0	.1	.5	.1	.1	0
5,001 to 10,000	1.4	0	.5	1.1	.5	.1	1.1	.7
2,001 to 5,000	1.5	.3	.5	2.8	2.0	.2	4.6	2.9
1,001 to 2,000	.6	.4	3.1	3.0	2.8	1.1	5.7	1.8
501 to 1,000	.8	.8	4.2	2.8	3.0	2.9	7.4	2.5
301 to 500	.5	1.0	2.6	7.7	3.4	3.5	5.2	1.4
201 to 300	.4	.6	3.7	2.3	2.6	3.2	4.3	1.4
101 to 200	.6	.8	3.7	6.1	3.9	6.0	4.7	1.1
51 to 100	.4	.8	1.0	3.4	3.9	4.6	2.7	2.9
3 to 50	1.8	1.8	.5	6.1	13.3	21.2	5.3	2.5
-2 to 2	85.0	84.2	69.6	64.8	49.7	41.1	44.2	58.5
-3 to -50	.8	1.4	3.7	0	2.2	4.5	2.5	1.3
-51 to -100	.6	1.0	.5	0	1.5	2.4	1.3	1.1
-101 to -200	.3	1.6	.5	0	1.4	2.7	1.2	3.6
-201 to -300	.1	1.1	.5	0	.8	1.4	1.2	.4
-301 to -500	.4	1.3	1.0	0	1.2	1.9	1.5	3.2
-501 to -1,000	.7	1.5	2.1	0	1.7	1.9	2.6	3.6
-1,001 to -2,000	.6	.8	1.6	0	1.6	1.1	1.9	4.3
-2,001 to -5,000	1.0	.5	0	0	1.5	.2	1.9	4.0
-5,001 to -10,000	.8	0	.5	0	1.5	0	.5	2.2
-10,001 and less	.4	.1	0	0	1.0	0	.2	0

1 The number of dependent students with nonzero VA Educational Benefits was 5, too small for meaningful analysis of discrepancies.

2 Includes only cases with nonzero values.

3 Because the central processor for Pell applications provides only a total amount for other nontaxable income we could not use the application value as a default in our verification of the separate contributing parts. Thus, we accepted undocumented values for the separate parts. To avoid the problem of failure to report any of the separate parts during our documentation efforts, we set the amount reported on the application as a minimum for the total value. This tends to overestimate other nontaxable income somewhat and precludes negative discrepancies.

TABLE 4-6

PERCENTAGE OF INDEPENDENT STUDENTS WITH DISCREPANCIES BY DOLLAR RANGE FOR SELECTED APPLICATION ITEMS

Value of Item Discrepancy ($)	Adjusted Gross Income	U.S. Taxes Paid	Social Security Educational Benefits[1]	Other Nontaxable Income[2]	Cash/ Savings Checking	VA Educational Benefits[1]
10,001 and more	.2	0	0	0	0	0
5,001 to 10,000	.3	0	0	.3	0	0
2,001 to 5,000	1.7	.2	1.5	4.4	.2	3.3
1,001 to 2,000	2.1	.4	5.9	2.4	.4	23.3
501 to 1,000	1.3	.3	2.9	2.6	1.3	6.7
301 to 500	.9	.7	2.9	2.0	1.4	0
201 to 300	.8	.7	1.5	1.6	2.0	0
101 to 200	.9	.6	0	3.3	3.8	0
51 to 100	.6	.6	0	1.5	3.4	0
3 to 50	2.4	2.4	0	4.3	16.5	0
-2 to 2	77.9	84.9	66.2	77.6	61.1	50.0
-3 to -50	1.4	1.5	2.9	0	3.0	0
-51 to -100	.3	1.5	1.5	0	2.0	0
-101 to -200	.6	3.1	1.5	0	2.0	0
-201 to -300	.6	1.0	1.5	0	.6	0
-301 to -500	1.4	1.0	1.5	0	.7	3.3
-501 to -1,000	3.2	.7	7.3	0	.9	3.3
-1,001 to -2,000	1.8	0	2.9	0	.2	6.7
-2,001 to -5,000	1.2	.3	0	0	.4	0
-5,001 to -10,000	.4	0	0	0	.1	3.3
-10,001 and less	0	0	0	0	0	0

[1] Includes only cases with nonzero values.

[2] Because the central processor for Pell applications provides only a total amount for Other Nontaxable Income, we could not use the application value as a default in our verification of the separate contributing parts. Thus, we accepted undocumented values for the separate parts. To avoid the problem of failure to report any of the separate parts during our documentation efforts, we set the amount reported on the application as a minimum for the total value. This tends to overestimate other nontaxable income somewhat and precludes negative discrepancies.

TABLE 4-7

RATES AND AMOUNTS OF DISCREPANCY FOR SELECTED HIGH ERROR APPLICATION ITEMS BY DEPENDENCY STATUS[1]

	Dependent				Independent			
	% Discrepant	Mean Absolute Discrepancy[2] ($)	Mean Best Value ($)	Ratio of Mean Discrepancy to Mean Best Value	% Discrepancy	Mean Absolute Discrepancy[2] ($)	Mean Best Value ($)	Ratio of Mean Discrepancy to Mean Best Value
Adjusted Gross Income	15.0	4,508	12,098	.37	22.1	1,608	3,794	.42
U.S. Taxes Paid	15.8	746	958	.78	15.1	321	177	1.81
Other Nontaxable Income[3]	35.2	863	959	.90	22.3	994	639	1.56
Household Size	30.5	N/A	N/A	N/A	8.4	N/A	N/A	N/A
Number in Postsecondary Education	18.6	N/A	N/A	N/A	6.9	N/A	N/A	N/A
Cash/Savings/Checking	30.3	1,322	1,101	1.20	38.9	202	181	1.12
Home Value	30.5	14,081	22,644	.62	5.4	9,154	2,955	3.10
Home Debt	23.2	3,323	9,339	.36	5.7	5,743	1,725	3.33
Spouse's/Mother's Earned Income	17.8	3,003	5,404	.56	5.8	2,418	1,154	2.10
Social Security Benefits (Parent)[3]	41.5	1,581	695	2.27	--	--	--	--
Social Security Educational Benefits[3]	30.4	911	137	6.65	33.8	1,993	116	17.18
Dependent Student's (Spouse's) Income	55.8	1,201	1,575	.76	--	--	--	--
Dependent Student's (Spouse's) Assets	58.4	279	166	1.68	--	--	--	--

[1]Dependency status switchers excluded.

[2]For those with discrepancy.

[3]Includes only cases with nonzero values for determining percentage with discrepancy.

whose reported dependency status was inconsistent with their verified dependency status. For purposes of comparison, this table also shows the mean best value for all sample cases by dependency status. Independent students had appreciably higher rates of discrepancy than dependent students only for AGI; for most other items the rates of discrepancy were higher for dependent students, with the exception of the U.S. taxes paid and Social Security educational benefits for which discrepancy rates were similar for both groups. The lower overall discrepancy rates for independent students are probably attributable to their smaller incomes and fewer assets, and may not indicate any substantive differences in tendency to misreport application items. (It is, for example, considerably easier to correctly report no other income than it is to document the exact amount of some other income.)

Perhaps the most revealing information in Table 4-7 is found in the column that shows the proportion of the mean absolute discrepancy for cases with discrepancy to the mean best value for all cases. The higher this proportion, the greater the amount of dollar error discrepancy that typically existed on that item. Those items with larger dollar discrepancies, however, were not necessarily those with the largest number of discrepant cases. Independent students showed much higher proportional discrepancy than dependent students, probably because of their generally lower levels of income and assets. These higher proportional discrepancies suggest that the reporting errors made by independent students were generally more serious. The item with the lowest proportional discrepancy for independent students and second lowest for dependent students was AGI. The highest levels of proportional discrepancy were found for Social Security educational benefits, perhaps reflecting the difficulty recipients had in separating educational from noneducational benefits.

For both dependent and independent students, about one-third of the cases had errors on other nontaxable income. Yet, this variable was itself composed of several items. Unfortunately, discrepancies for these components of other nontaxable income could not be determined because only the total amount was included on the application; the amounts of income attributable to each source were tallied by the applicant on a worksheet that was not part of the application itself. We can estimate the approximate order of discrepancies by component of other nontaxable income by looking at instances in which the best value for a component of other nontaxable income exceeded the reported value for all items. According to this estimate, the five

greatest contributors to error in other nontaxable income, in order of magnitude, were untaxed portion of unemployment compensation, child support, other welfare, noneducational VA benefits, and the 1981 interest/dividend exclusion. The last of these will not continue to be a source of error because of changes in the definition of this item by the Internal Revenue Service.

4.3 EVALUATION OF POSSIBLE CAUSES OF ERROR

In the previous section we reviewed the overall student error and the distribution of that overall error among component application items. In this section, we take a look at each of the student errors in an attempt to determine the possible cause(s) of that error. For convenience of reference, this discussion begins with the most problematic type of student error and proceeds according to the ranking of error in Table 4-4. We first make an identification of possible causes, followed by bivariate and multivariate regression analyses. Students whose reported dependency status does not agree with their best dependency status are treated first. Dependency status switchers are excluded from other analyses in this chapter.

4.3.1 Enumeration of Possible Causes

Using the same ground rules as described in Section 3.3.1 for institutional error, we identified those characteristics of student recipients that held the most promise for causal relationships. Table 4-8 itemizes the variables we determined most likely to offer causal explanations. These variables fall into three groups: individual application items, composite application items, and environmental factors. Most of the possible causes of student error emerge from the application because that is the source for nearly all of the information typically available for a Pell recipient. This implies that the development of corrective actions for student error, which are based on the possible causes identified here, will focus largely on application-related issues. The last possible cause of student error listed in Table 4-8 concerns student selection for validation. Because of its probably significant impact on student error reduction and its relationship to institutional compliance with validation requirements, it is treated as a separate topic in Chapter 5, and is touched upon only tangentially in this discussion.

TABLE 4-8

CHARACTERISTICS USED TO
ANALYZE POSSIBLE CORRELATES OF STUDENT ERROR

Application Items

Adjusted Gross Income
U.S. Taxes Paid
Parents' Marital Status
Student's Marital Status
Father's/Applicant's Earned Income
Mother's/Spouse's Earned Income
Claimed by Parents, 1981
Lived with Parents, 1981
Medical/Dental Expenses
Cash, Savings, and Checking
Dependent Student's (and Spouse's) Income
Dependent Student's (and Spouse's) Assets
Tax Filing Status (and Tax Figures Used)
Household Size
Number in Postsecondary Education

Composite Application Items

Dependency Status
Income (AGI + AFDC + Other Nontaxable Income + Parent's Social Security Benefits - U.S. Taxes Paid)
Net Worth
Home Equity

Environmental Factors

Type and Control of Institution Attended
Problems Reported with Application
Application Processor
Validation Status and Compliance

4.3.2 Simple Bivariate Causal Analysis

In this section we review rates and amounts of error for the various application items, groups of application items, and other possible causes of student error. The student characteristics reviewed for error were usually application or reported values, since these were the only values that were available for decisions about the need to validate students with particular characteristics. Error for these reported characteristics is summarized by rates and average amounts of error, overaward, and underaward for either a single characteristic or the joint relationship of two characteristics on error. The results of these causal analyses provide data for the development of corrective actions.

As we indicated above, the order in which the possible causes of error are treated corresponds roughly to their seriousness. Student application-item characteristics are covered first, in order of their dollar contribution to error, followed by characteristics not related to specific application items. The presentation order of the 10 causal student error topics is:

- Dependency status
- Reported income
- Household size
- Net worth
- Number in postsecondary education
- Tax filing and marital status
- Dependent student income
- Difficulty with application
- School of enrollment
- Application processor.

Analysis of Dependency Status

The largest single source of student error was due to students whose reported dependency status was not the same as their verified dependency status. We call these

cases dependency status switchers. Table 4-9 shows the numbers and percentages of cases for all the combinations of reported and verified dependency status. Overall, 5.5 percent of the cases applied using the incorrect dependency status, with the overwhelming majority of the switchers (5.1 percent of the sample, 93 percent of all switchers) being dependent students who applied as independent. This, of course, was the direction which usually produced a lower SAI and larger award because parents' income and assets were usually greater than those of students. Translating these percentages into program-wide estimates suggests that more than 139,000 Pell recipients applied with an incorrect dependency status, with 129,000 applying as independent students when they were dependent according to Pell definitions and only 10,000 erring in the opposite direction.

A more detailed breakdown of the implications of incorrectly reported dependency status is shown in Table 4-10. The figures reported in the left column are dependency status error excluding students whose SEP/FAT/Invalid SAR Errors make them ineligible. Some of these same figures are reported in Table 4-4, student error by application items. The dollar figures in the right column are slightly higher because they consider recipients with SEP/FAT/Invalid SAR Errors as eligible. It is interesting to note that that those few recipients who incorrectly applied as dependent students had a very small mean error, and a very large proportion with zero error. This group appears to be made up largely of low income students from low income families, such that a change in dependency status had little or no affect on SAI. Even on a program-wide basis, this group had negligible dollar impact on error. The group which accounted for nearly all of the dollars awarded in error was students who applied as independent and were verified as dependent. Even though more than a quarter of these dependency status switchers had zero error (the SAI computed on the parents' income and assets remains the same as that computed from student income and assets, probably zero, because of equally low family contributions), the mean error was over $500.

Dependency status is a composite derived from the answers to three questions asked for both the base year (1981) and the current year (1982): lived with parents in 1981, lived with parents in 1982, supported by parents in 1981, supported by parents in 1982, claimed by parents in 1981, claimed by parents in 1982. (For married students, only the three items for 1982 were considered.) We are, therefore, interested in knowing which item or items among the verified items were responsible for the change

TABLE 4-9

REPORTED VERSUS VERIFIED DEPENDENCY STATUS

Reported Dependency Status	Verified Dependency Status: Dependent	Verified Dependency Status: Independent	
Dependent	N = 1,958 Weighted N = 2,139 Weighted % = 58.6	N = 12 Weighted N = 14 Weighted % = .4	59%
Independent	N = 68 Weighted N = 186 Weighted % = 5.1	N = 1,137 Weighted N = 1,312 Weighted % = 35.9	41%
	63.7%	36.3%	

TABLE 4-10

DEPENDENCY STATUS ERROR

	Treating Cases with SEP/FAT/Invalid SAR Error as	
	Ineligible[1]	Eligible
All Dependency Status Error		
Mean Error ($)	465.00	508.70
Percentage of Switchers with Zero Error[2] (%)	32.5	28.6
Program-Wide Estimate ($ Millions)	64	70
Independent to Dependent		
Mean Error ($)	500.20	547.00
Percentage of Switchers with Zero Error[2] (%)	28.8	24.2
Program-Wide Estimate ($ Millions)	64	70
Dependent to Independent		
Mean Error ($)	-33.40	-33.40
Percentage of Switchers with Zero Error[2] (%)	54.5	54.5
Program-Wide Estimate ($ Millions)	-.3	-.3

[1]The values in this column are used in Table 4-4, which presents net student award error by application item.

[2]A certain percentage of dependency status switchers have zero error because their Student Aid Index did not change. These cases are generally students of low income families with very low incomes themselves. Thus, whichever figures are used the SAI is usually zero.

in dependency status and the source of the problem on the application. For students who applied as independent and were found to be dependent, our analysis revealed the following:

- 22.4 percent were independent according to all 1981 items, but verified as dependent by one or more 1982 items.
- 21.1 percent were independent according to Claimed by Parents in 1982, but verified as dependent by both of the other 1982 items.
- 16.8 percent were independent according to Claimed by Parents in 1981, but verified as dependent by both of the other 1981 items.

These breakdowns, which are not mutually exclusive, suggest that students with independent to dependent dependency status error were most often in error on the 1982 items, which were largely prospective when the application was filled out, and on the lived with parents and supported by parents items, which were difficult to answer and are difficult to document.

Any effort at corrective actions to reduce dependency status error requires a profile of those recipients most likely to have this error. Thus, we have investigated the differences between reported independent students whose verified dependency status was dependent and those whose verified dependency status was independent. The results for three student characteristics--age, marital status, and household size--that suggest differences between the two groups are shown in Table 4-11. Dependency status switchers, those students who reported independent status but were verified as dependent, were more likely to be younger, single, and have a household size of one.

A summary of case, student, and institutional error by dependency status appears in Table 4-12. Separate columns are presented for students whose reported depenency status and verified dependency status agreed and those whose status changed. For both student and case error, mean net error per recipient with error for independent nonswitchers is low but positive, with slightly higher error for dependent nonswitchers. Students who reported as dependent but were verified as independent had negative mean net errors. The highest amounts and rates of error for both case and student errors were found for independent to dependent status switchers. Institutional error, not surprisingly, varied considerably across dependency status.

TABLE 4-11

COMPARISON BETWEEN INDEPENDENT STUDENTS WITH VERIFIED DEPENDENCY STATUS OF INDEPENDENT AND DEPENDENT ON THREE STUDENT CHARACTERISTICS

Student Characteristic	Initially Claimed Dependency Status: Independent (Nonswitchers) (%) (Weighted N = 1,301)	Initially Claimed Dependency Status: Dependent (Switchers) (%) (Weighted N = 186)
Age		
Less than 20	8.2	24.5
20 to 25	46.7	63.5
Over 25	45.1	12.0
Marital Status		
Married	26.4	9.0
Separated/Divorced/Widowed	4.9	10.5
Single	68.7	80.5
Household Size		
One	46.2	70.6
Two	21.1	17.3
Three	15.4	6.3
Four	10.3	2.1
Five or more	6.9	3.8

TABLE 4-12

AMOUNTS AND RATES OF CASE, STUDENT, AND INSTITUTIONAL ERROR BY DEPENDENCY STATUS

	Reported and Verified Dependency Status Agree				Change From Reported to Verified Dependency Status			
	Dependent (N = 1,938)		Independent (N = 1,123)		Dependent to Independent (N = 12)		Independent to Dependent (N = 67)	
	Mean Error per Recipient w/Error ($)	Cases w/Error (%)	Mean Error per Recipient w/Error ($)	Cases w/Error (%)	Mean Error per Recipient w/Error ($)	Cases w/Error (%)	Mean Error per Recipient w/Error ($)	Cases w/Error (%)
Case Error								
Net	70.70	67.0	41.00	46.6	-93.68	66.5	594.55	90.3
Overaward	298.14	44.2	376.80	24.7	975.00	8.3	845.88	72.0
Underaward	-267.62	22.8	-237.91	21.9	-300.89	58.2	-390.00	13.7
Student Error								
Net	81.75	53.0	36.85	16.0	-30.67	41.8	551.90	75.1
Overaward	275.92	40.5	391.18	11.9	1,087.00	8.3	803.68	72.0
Underaward	-240.34	12.5	-229.83	4.2	-363.50	33.5	-889.00	3.0
Institutional Error								
Net	-11.01	26.3	4.13	36.0	-63.01	49.9	42.67	42.6
Overaward	294.30	9.7	342.99	15.5	172.00	8.3	496.57	21.3
Underaward	-237.75	16.6	-239.86	20.5	-186.47	41.5	-296.21	21.3

Analysis of Income

One dimension of possible discrimination between cases with error and no error is reported income. Income rather than AGI was used as being more representative of the family's full income strength. Table 4-13 shows student error by income ranges for dependent recipients. Clearly, the higher the income involved, the higher the percentage of cases in error. There was not, however, much variation by income group in the mean amount of net error per recipient with error. Cases with overaward and underaward followed the same pattern in terms of percentage of cases with error, but a more unusual pattern in amount of error, with the two extreme income groups having the lower values. While reported income tended to miss the mark more often for the highest income group, it had, on the average, less payment consequences than income reporting errors made by lower income families.

Table 4-14 looks at the same factors for independent recipients. The income ranges, however, have been modified to be more meaningful in portraying the economic condition of this group. In general, the distribution of error cases was similar to that of dependent recipients; the percent of cases in error for all three measures increased as income increased. The payment significance of that error, however, was different. For mean net error per recipient with error and for mean overaward, the mean payment error decreased as the income increased. For the $12,000 and over range, the mean net error was only $17.33 per case with error, even though slightly more than 50 percent of the cases in that range were in error. On the other end of the scale, only 16 percent of the lowest range had reported income error, but it amounted to over $780 per case.

In general, these tables show that there is a discernable tendency for the rate of error to be correlated to recipient income, but that the magnitude of error did not vary much by income range for dependent students. For independent students, however, the large errors were in the lower income groups, even though the frequency of error was less.

Our final analysis of error by income looks at student error for all of the combinations of reported income by verified income. The results for dependent students are shown in Table 4-15. An examination of these data reveal that the percentage of cases with error was generally higher for those stduents with higher

TABLE 4-13

STUDENT ERROR FOR DEPENDENT STUDENTS BY REPORTED INCOME[a]

Reported Income ($)	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
0 - 5,999	28.6	146.66	21.6	244.77	7.1	-153.24
6,000 - 11,999	41.7	141.22	32.7	261.26	9.0	-295.37
12,000 - 17,999	62.4	143.11	45.6	291.00	16.8	-258.10
18,000 - 23,999	72.5	176.12	56.4	297.81	16.1	-250.75
24,000 and over	84.8	151.09	63.7	235.23	21.1	-102.77

[a] Income = AGI + AFDC + Other Nontaxable Income + Parent's Social Security Benefits - U.S. Taxes Paid.

TABLE 4-14

STUDENT ERROR FOR INDEPENDENT STUDENTS BY REPORTED INCOME[a]

Reported Income ($)	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
0 - 2,999	15.8	780.17	15.6	795.66	.2	-355.00
3,000 - 5,999	24.0	444.17	20.4	572.42	3.6	-286.31
6,000 - 8,999	21.7	275.94	16.5	474.39	5.2	-357.34
9,000 - 11,999	42.2	198.55	31.7	342.29	10.5	-233.39
12,000 and over	50.5	17.33	27.5	288.30	23.0	-306.42

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[a] Income = AGI + AFDC + Other Nontaxable Income - U.S. Taxes Paid

TABLE 4-15

STUDENT ERROR FOR DEPENDENT STUDENTS
BY DIFFERENCES IN REPORTED AND VERIFIED INCOME

Reported Income [a] ($)	Verified Income [a] ($) 0 - 5,999	6,000 - 11,999	12,000 - 17,999	18,000 - 23,999	24,000 +
0 - 5,999	25.27% $ 33.73 (n = 66)	45.18% $ 311.82 (n = 16)	19.01% $1,525.00 (n = 1)	100.00% $ 818.00 (n = 1)	17.79% $1,526.00 (n = 1)
6,000 - 11,999	16.62% $ -52.97 (n = 5)	40.98% $ 90.67 (n = 203)	57.99% $ 372.01 (n = 27)	100.00% $ 822.03 (n = 7)	100.00% $435.00 (n = 1)
12,000 - 17,999	87.76% $ -210.83 (n = 7)	53.56% $ -251.93 (n = 7)	61.10% $ 134.17 (n = 301)	84.25% $ 346.78 (n = 16)	100.00% $1,152.86 (n = 5)
18,000 - 23,999	100.00% $-1337.00 (n = 1)		100.00% $ -28.52 (n = 6)	70.72% $ 179.93 (n = 238)	100.00% $378.44 (n = 19)
24,000 +				100.00% $ 83.69 (n = 2)	84.48% $152.72 (n = 88)

Items per cell: Cases with Error (%)
Mean Net Student Error Per Recipient with Error ($)
A blank cell indicates no cases in that cell.

[a] Income = AGI + AFDC + Other Nontaxable Income + Parent's Social Security Benefits - U.S. Taxes Paid

verified family income. The mean dollar amounts of that error were also greater for those with higher verified income. Both the percentages and amounts of error were lowest for families with less than $12,000 reported and verified income. The direction of student error was consistent with expectations. Students whose reported family income was greater than the verified income showed substantial underawards while those who underreported their income showed overawards. The figures across the diagonal, which represent families with similar reported and verified income, account for the overwhelming majority of cases. Both the percentage of cases with error and amounts of error increased with higher income but the dollar amounts of error were among the lowest.

The results for independent students, shown in Table 4-16, follow a similar pattern, with lowest rates of error shown for those with lower verified income. Because of the smaller number of cases involved in the higher income levels, discernable patterns in amounts of error were harder to detect. In general, however, errors along the diagonal were lowest in both percentage of cases with error and mean error.

Analysis of Household Size

Table 4-17 reports the distribution of student error by reported size of the recipient's family. For dependent students there was no definitive pattern of error to suggest that any causal relationship between student error and dependent recipient's household size existed. Much the same can be said for the household size of independent recipients. While error frequency was significantly less when the student had no dependents, the magnitude of the error was little different than for other income groups. Otherwise, the frequency of cases in error was fairly evenly spread over income groupings. The one exception was the "6 or more" category, which had a substantially higher rate of incidence, the difference being in the underaward category. However, the number of cases involved was relatively small and the difference may reflect the influence of only a few cases.

Analysis of Net Worth

The distribution of student error according to ranges of net worth revealed nothing startling for dependent students. Table 4-18 illustrates that, except for an

TABLE 4-16

STUDENT ERROR FOR INDEPENDENT STUDENTS
BY DIFFERENCES IN REPORTED AND VERIFIED INCOME

Reported Income [a] ($)	Verified Income [a] ($) 0 - 2,999	3,000 - 5,999	6,000 - 8,999	9,000 - 11,999	12,000 +
0 - 2,999	2.05% $ 568.21 (n = 8)	26.41% $450.49 (n = 10)	29.48% $ 46.00 (n = 1)		100.00% $1,363.00 (n = 1)
3,000 - 5,999	16.36% $-439.85 (n = 3)	11.50% $ 94.09 (n = 34)	62.48% $ 550.28 (n = 12)	66.69% $ 232.31 (n = 4)	100.00% $1,438.00 (n = 1)
6,000 - 8,999			15.97% $ 171.35 (n = 19)	59.57% $ 480.35 (n = 6)	100.00% $ 206.00 (n = 1)
9,000 - 11,999		100.00% $-70.00 (n = 1)	22.43% $ 241.73 (n = 2)	33.24% $ 86.86 (n = 31)	92.54% $ 366.44 (n = 13)
12,000 +					50.35% $ 98.80 (n = 29)

Items per cell: Cases with Error (%)
Mean Net Student Error Per Recipient with Error ($)
A blank cell indicates no cases in that cell.

[a] Income = AGI + AFDC + Other Nontaxable Income - U.S. Taxes Paid

TABLE 4-17

STUDENT ERROR FOR DEPENDENT AND INDEPENDENT STUDENTS BY REPORTED HOUSEHOLD SIZE

Reported Household Size	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
Dependent Students						
2	49.3	171.46	40.0	289.20	9.3	-343.20
3	60.1	180.16	46.9	292.08	13.2	-216.85
4	51.0	125.66	37.8	269.86	13.2	-286.42
5	56.6	171.18	44.5	275.60	12.1	-212.18
6 or more	46.1	110.01	31.7	248.68	14.3	-196.82
Independent Students						
1	10.9	352.89	8.5	517.45	2.4	-228.84
2	27.9	374.94	22.5	524.16	5.4	-250.94
3	33.2	429.46	29.2	508.78	4.0	-150.16
4	31.8	655.34	30.5	688.04	1.2	-158.57
5	35.9	398.86	24.8	825.59	11.1	-554.60
6 or more	46.3	396.25	34.1	693.00	12.2	-432.92

TABLE 4-18

STUDENT ERROR FOR DEPENDENT STUDENTS BY REPORTED NET WORTH [a]

Reported Net Worth ($)	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
0 - 1,000	36.5	162.33	29.8	240.29	6.7	-181.39
1,001 - 5,000	55.4	203.13	46.3	267.30	9.1	-125.38
5,001 - 15,000	47.4	153.11	35.7	274.62	11.7	-217.02
15,001 - 25,000	58.2	171.78	47.5	267.70	10.7	-253.06
25,001 - 40,000	71.4	150.30	49.4	321.33	22.0	-233.39
40,001 - 60,000	69.7	65.47	46.8	258.21	22.9	-328.20
60,001 and over	56.8	139.60	40.7	332.39	16.1	-346.60

[a] Net Worth = Home Equity + Real Estate/Investment Equity + Business/Farm Equity + Cash/Savings/Checking (negative values set to zero before adding)

occasional variation, probably as a result of small cell size, both the frequency and magnitude of error were fairly evenly distributed. Error was somewhat less likely to occur in the lowest net worth range, but that was probably a residual of related low income since this level of net worth would have no impact upon the SAI calculation.

The analysis of net worth for independent students was divided into those with no dependents and those with two or more, assuming that different financial circumstances were represented by these two groups. The top of Table 4-19 reports the results for independent recipients without dependents. Other than the expected fact that net worth was normally underreported rather than overreported, nothing revealing was seen. The number of cases involved in the net worth ranges over $2,000 makes any interpretation questionable.

When independent recipients with dependents were reviewed, the expected pattern emerged. The bottom of Table 4-19 shows the general tendency for the error rate to go up with increased net worth. (The ranges used for this part of the table are the same as those used for dependent students.) The magnitude of error had no particular pattern, except that the $40,001-60,000 range had both the highest mean overaward and the highest mean underaward. Again, however, the number of cases precluded attaching any high level significance to that finding.

Analysis of the Number in Postsecondary Education

When the number of family members enrolled in postsecondary education was considered, the results revealed little of a possible causal nature. As shown in Table 4-20 there was almost no difference in the percentage of cases with error between dependent students who were the only postsecondary enrollee and those who had other family members enrolled. There was a slightly greater tendency for the former to be overawarded, and the latter to be underawarded, but not enough difference to suggest that number in postsecondary education was a cause of error.

Table 4-20 also displays the distribution of student error for independent recipients. While those cases with only one student in the family were less likely to have error than those with more than one, the mean net error for those with error was little different.

TABLE 4-19

STUDENT ERROR FOR INDEPENDENT STUDENTS BY REPORTED NET WORTH[a]

Reported Net Worth ($)	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
Household Size of 1						
0 - 500	20.8	627.17	18.6	750.65	2.2	-418.40
501 - 1,000	22.0	1042.82	16.0	1442.75	6.0	-30.00
1,001 - 2,000	14.8	76.26	14.8	76.26	0	0
2,001 - 2,500	50.0	-386.00	0	0	50.0	-386.00
2,501 - 5,000	64.3	50.11	40.5	183.34	23.8	-176.35
5,001 and over	50.0	167.00	50.0	167.00	0	0
Household Size of 2+						
0 - 1,000	21.6	278.94	17.0	427.41	4.6	-268.70
1,001 - 5,000	30.6	272.15	22.2	425.61	8.5	-129.07
5,001 - 15,000	39.6	362.37	36.9	412.79	2.8	-308.00
15,001 - 25,000	42.2	210.84	23.5	585.96	18.7	-259.87
25,001 - 40,000	33.7	471.60	33.7	471.60	0	0
40,001 - 60,000	49.7	161.67	26.1	877.00	23.6	-627.0
60,001 and over	0	0	0	0	0	0

[a] Net Worth = Home Equity + Real Estate/Investment Equity + Business/Farm Equity + Cash/Savings/Checking (negative values set to zero before adding)

TABLE 4-20

STUDENT ERROR FOR DEPENDENT AND INDEPENDENT STUDENTS
BY NUMBER IN POSTSECONDARY EDUCATION

Number in Postsecondary Education	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
One						
Dependent Students	52.1	181.04	41.7	290.53	10.4	-255.83
Independent Students	21.0	435.56	17.4	592.08	3.6	-311.99
More Than One						
Dependent Students	54.2	105.77	37.7	250.09	16.5	-224.61
Independent Students	42.2	418.89	35.3	539.98	6.9	-204.81

Analysis of Tax Filing and Marital Status

We next looked at whether or not the recipient's family filed a Federal income tax return. Table 4-21 separates those dependent cases who filed and did not file a tax return, by whether the parents were married or single. Those cases where a tax return was filed were more likely to be in error than those who did not file. This should not necessarily be interpreted as implying that filers are generally less accurate than nonfilers. There are several factors that may be operating here:

- Tax filers have more documentation available to help identify error. It is very difficult to determine if nonfilers have revealed all their income. In the absence of contrary documentation, this study had no choice but to conclude that there was no error.
- Legitimate nonfilers have, in general, very little to misreport. Thus, their opportunity to err was much less.
- Even when nonfilers err, the amounts involved were relatively small and had few payment consequences.

Where error was identified, the magnitude of that error, whether mean net, overaward, or underaward, showed little variance between filers and nonfilers, whether married or single.

Table 4-22 looks at independent cases on the same filed/not filed dimension. The same pattern of cases in error is displayed for dependent cases, with nonfilers showing less error than filers. The same explanation probably applies here. Moreover, the "did not file" category had a limited number of cases and should be interpreted carefully. It should be noted that while married filers had a higher tendency to err, the dollar consequence of that error was considerably less in this study sample.

When the tax filers were separated into those that used estimates to complete the Pell application and those that used actual figures, there was an interesting paradox. There was, as shown in Table 4-23, very little improvement in the percentage of cases with error when actual tax return data were reported. That may seem surprising until one considers that the six highest sources of student error come from application items that do not have an IRS 1040 or 1040A counterpart. Thus,

TABLE 4-21

STUDENT ERROR FOR DEPENDENT STUDENTS BY TAX RETURN FILING

	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
Filed						
All	56.0	151.59	42.5	274.82	13.5	-237.47
Married Parents	59.2	157.04	44.7	279.91	14.5	-221.07
Single Parents [a]	50.3	140.63	38.7	264.78	11.6	-272.53
Did Not File						
All	32.3	150.78	24.8	283.90	7.5	-286.49
Married Parents	39.0	137.82	30.2	232.97	8.8	-190.14
Single Parents [a]	29.9	156.94	22.8	309.37	7.1	-334.67

[a] Includes single, separated, divorced, and widowed parents.

TABLE 4-22

STUDENT ERROR FOR INDEPENDENT STUDENTS BY TAX RETURN FILING

	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
Filed						
All	26.5	349.94	21.0	515.11	5.5	-285.04
Married	31.3	161.01	21.7	350.84	9.6	-266.90
Single	25.3	461.66	21.7	598.17	3.6	-364.46
Separated, Divorced, and Widowed	21.5	460.27	17.9	581.62	3.6	-149.82
Did Not File						
All	16.0	744.65	15.5	779.82	0.5	-422.00
Married	25.0	1036.77	21.7	1272.93	3.3	-509.00
Single	16.5	780.52	16.5	780.52	0	0
Separated, Divorced, and Widowed	12.0	431.31	10.9	513.18	1.1	-355.00

TABLE 4-23

STUDENT ERROR FOR DEPENDENT AND INDEPENDENT STUDENTS
BY TAX FILING STATUS

	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
Filed						
Estimated Figures Used						
Dependent Students	57.4	165.21	43.8	278.33	13.6	-199.65
Independent Students	29.4	560.66	25.0	720.74	4.4	-353.03
Actual Figures Used						
Dependent Students	56.4	144.44	42.7	272.32	13.7	-252.64
Independent Students	25.5	284.56	19.3	467.98	6.2	-285.74
Did Not File						
Dependent Students	34.9	182.42	27.0	297.99	7.9	-214.71
Independent Students	17.9	676.49	17.4	701.64	0.5	-211.52

having actual tax return figures did little, if anything, to improve the reporting error on those six items most responsible for student error.

As in the previous analysis, independent students had lower incidences of cases in error, but greater magnitudes of error per recipient with error, than did dependent students. Also, it should be noted that while the percent of cases with error for filers using actual figures was slightly lower than those using estimated data, the mean net error was only about half as large. Having the actual figures seemed to improve independent data more than dependent data. As in Tables 4-21 and 4-22, the nonfilers had the lowest rate of error.

To test our supposition about the effect of using actual tax return figures, we looked specifically at those application items that can be taken directly from the IRS 1040. As can be seen from Table 4-24, using actual AGI and taxes paid did improve the accuracy of the application data, to a statistically significant degree. Earned income was more difficult to obtain from the 1040, being available directly only when there was one wage earner in the reporting family. We are uncertain why the accuracy of medical/dental expenses was slightly less when using actual figures, but the affect of that item on Pell Grant payment was too insignificant to even warrant speculation. It should be noted that this table probably understates the effect of using actual 1040 figures. Like the data themselves, whether actual or estimated numbers were used was self-reported by the application filer and may have been incorrectly reported. Presumably, error in the "actual" column of the table for AGI and taxes paid represents error attributable to causes other than the tax return, except for a small number of amended returns or copying errors.

Analysis of Dependent Student Income

The next bivariate analysis conducted was a comparison of error by income ranges for dependent students (and spouses, if any). Table 4-25 displays the finding that dependent student income had very little, if any, correlation with student error. Other than the fact that the cases in the highest income category were likely to have the highest overaward and the lowest underaward, there was no discernible pattern. This was not surprising because of the small proportion of family income typically contributed by dependent students and the change in regulations to permit use of

TABLE 4-24

DIFFERENCES IN SELECTED APPLICATION ITEM ERROR RATES BY THOSE USING ESTIMATED AND ACTUAL TAX RETURN FIGURES

Application Item	Tax Figures Used: Estimated (% W/Discrepancy)	Tax Figures Used: Actual (% W/Discrepancy)	Chi Square[a]	Probability[b]
Adjusted Gross Income	44.7	32.4	25.459	.0001*
U.S. Taxes Paid	33.8	14.3	99.398	.0001*
Father's/Applicant's Earned Income	36.7	33.4	1.844	.1745
Mother's/Spouse's Earned Income	27.0	21.8	6.015	.0142*
Medical/Dental Expenses	25.1	28.8	2.644	.1039

a All chi square tests are discrepancy (yes/no) by tax return figures (actual/estimated), with one degree of freedom.

b Those with probabilities of less than or equal to .05 are considered significant and marked by an asterisk.

TABLE 4-25

STUDENT ERROR FOR DEPENDENT STUDENTS BY DEPENDENT STUDENT'S (SPOUSE'S) INCOME

Dependent Student's (Spouse's) Income ($)	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
0 - 1,000	49.1	175.31	38.7	279.40	10.4	-213.52
1,001 - 2,500	60.9	114.50	44.7	256.25	16.2	-275.22
2,501 - 5,000	57.7	129.27	42.2	282.38	15.5	-286.74
5,001 and over	50.1	150.26	30.4	353.24	19.7	-163.00

expected earnings of dependent students if they where anticipated to be less than 60 percent of those reported in the previous year.

Analysis of Applicant-Reported Difficulty with the Application

One hypothesis about student error has been that error is related to the level of difficulty experienced in understanding the application form and related instructions. Many complaints are heard about the complexity of the form and its error-proneness. Thus, we asked the independent applicants and the parents of dependent applicants if they had difficulty completing the application form when they were interviewed in the spring of 1983. Tables 4-26 and 4-27 were developed on the basis of these responses. Overall, there was little difference in percentage of cases with error between those who reported problems and those who did not. All three percentage columns in Table 4-21 are very similar. There was, however, some variation in the magnitude of the error, with those reporting no problem with the application having, on average, somewhat more correct application values. Table 4-22 dissects that error into selected application items and compares the error rates on that basis. Here some differences in the expected direction were demonstrated. However, only three of them--lived with parents, 1981; claimed with parents, 1981; and home equity--were statistically significant. The potential effect of that finding should not be overlooked, as these three items contributed heavily to the payment error being addressed.

Analysis of the Recipient's School of Enrollment

Another bivariate comparison attempted was student error by type and control of institution attended. Although this obviously is not a student characteristic per se, we wanted to see if institutional features might be a useful proxy for the type of student who was susceptible to reporting error. Our findings are shown in Table 4-28. Students at 2-year public institutions had the lowest rate of error, followed by the proprietary institutions, 4-year publics, and 2- and 4-year private or independent institutions. Interestingly, the distribution of cases with error approximates the pricing structures of the institutional types represented in the table. The private institutions enroll the larger proportions of error cases, which might relate to the fact that higher income students tend to enroll there. The lower mean net error per case with error, however, may relate to recipients at private institutions who,

TABLE 4-26

STUDENT ERROR BY REPORTED PROBLEMS WITH APPLICATION

Difficulty Completing Application	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
Had Problems	38.8	229.54	29.0	381.98	9.8	-222.03
Had No Problems	40.7	205.59	31.8	338.57	8.9	-271.05

TABLE 4-27

RELATIONSHIP BETWEEN PROBLEM AREAS OR ITEMS ON THE APPLICATION AND ITEM DISCREPANCY FOR SELECTED ITEMS

Item	Applicants with Discrepancy: Reporting Problem	Applicants with Discrepancy: Not Reporting Problem	Chi Square[a]	Probability[b]
AGI	20.6	16.5	1.892	.1690
Taxes Paid	15.7	14.5	.158	.6907
Other Nontaxable Income	33.3	27.7	2.654	.1033
Household Size	31.2	23.8	.964	.3261
Number in Postsecondary Education	16.0	14.7	.031	.8599
Lived with Parents, 1981	16.0	4.3	24.371	.0001*
Claimed by Parents, 1981	11.9	5.0	5.5	.0192*
Home Equity	47.2	31.7	3.937	.0472*
Dependent Student's Assets	46.2	49.6	.456	.4997
Dependent Student's Income	50.5	48.6	.136	.7122

a All chi square tests are problem (yes/no) by discrepancy (yes/no), with one degree of freedom.

b Those with probabilities less than or equal to .05 are considered significant, and marked by an asterisk.

TABLE 4-28

STUDENT ERROR BY TYPE AND CONTROL OF INSTITUTION

Institutional Type and Control	Cases W/Error (%)	Mean Net Student Error Per Recipient W/Error ($)	Cases W/Overaward (%)	Mean Overaward ($)	Cases W/Underaward (%)	Mean Underaward ($)
Less Than 2 Year Proprietary	38.8	229.85	31.1	324.53	7.8	-149.70
2 Year Proprietary	34.6	383.10	26.3	574.96	8.3	-228.33
2 Year Public	26.0	228.45	20.9	348.11	5.1	-258.76
4 Year Public	41.7	227.00	32.7	358.78	9.0	-253.01
2 Year Private	44.8	134.77	32.5	276.55	12.3	-238.77
4 Year Private	59.6	184.76	44.8	332.07	14.8	-261.51

because of their higher cost, were at and stayed at the maximum grant even with "best value" recomputation of award amount. There is no readily apparent explanation for the higher mean overaward for 2-year proprietary school students. Otherwise, there was not much variance among institutional types with respect to mean overawards and underawards.

Analysis of Student Error by Application Processor

The final bivariate comparison concerns the application processor. Although this is not a student characteristic, there may be differences in the types of students using the various processors, so its inclusion in this chapter is appropriate.

Applications for a Pell Grant are handled in several basic ways. Some are submitted directly to the Pell central processor, a Federal contractor that accepts Pell applications for the Department of Education and processes them. The result is a Student Aid Report (SAR) which summarizes the application items and shows the computed Student Aid Index (SAI). Other financial aid applicants complete a single application for all financial aid (as required by the institution they are planning to attend or their state*) which is processed by one of three Multiple Data Entry (MDE) processors: College Scholarship Service (CSS), American College Testing (ACT) Program, or the Pennsylvania Higher Education Assistance Authority (PHEAA). For students indicating that they wish to be considered for a Pell Grant, the MDE submits data tapes of application items to the Pell processor which then computes the SAI and prepares the SAR.

A review of student error by processor revealed interesting and statistically significant results, as shown in Table 4-29. We would like to emphasize that these differences in rates of student error reflect differences in the applicant constituencies for each processor and do not reflect the accuracy of the processing itself.** The

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*Students in California submit a special state application, but these are processed for California by CSS.

**In the 1980-81 quality control report on the then BEOG program, we investigated and reported MDE data entry errors. While there were some differences among the processors, overall error rates were so low that this task was not repeated for this year.

TABLE 4-29

RATES OF STUDENT ERROR BY APPLICATION PROCESSOR

	Cases with Error* (%)	Cases with No Error (%)	Weighted Number of Cases
Initial Processor			
Pell	29	71	908
ACT	42	58	716
CSS	44	56	1,790
PHEAA	56	44	216

*Chi square = 78.74, df = 3, p .001.

lowest rates of student error are shown for applicants who used the Pell processor only. Students in this category were more likely to attend lower cost institutions and two year (or less) institutions. Their lower error rates may reflect the less complicated financial circumstances expected in this group. Applicants using ACT and CSS had intermediate student error rates. Schools requesting that students use these services include most four year institutions. The highest error rates were associated with the PHEAA students. Because this group represented only 6 percent of applicants, a few higher error cases can greatly affect the combined outcome. Therefore, we would caution about drawing any conclusions on this small sample of PHEAA applicants.

4.3.3 Multivariate Analysis

So far we have looked at possible causes of error through bivariate analyses. Multivariate analysis permits the joint testing of the effects of several student characteristics on error. We have estimated two linear multiple regression models, one with net student error as the dependent variable and one with absolute error as the dependent variable.

The student or student-related characteristics chosen for inclusion in each model as independent variables were:

- Effective family income
- Household size
- Age
- Student marital status
- Student was or was not validated by institution
- Type and control of institution attended
- Whether institution validates all students.

Table 4-30 shows the results of each of the two regression models. Both models share the same seven independent variables, which are shown as row entries. The last row shows the R-square for each model. R-square reveals the proportion of variance

TABLE 4-30

ESTIMATED DIFFERENCES IN AVERAGE STUDENT ERROR ATTRIBUTABLE TO SEVERAL STUDENT AND INSTITUTIONAL CHARACTERISTICS

	Net Student Error	Absolute Student Error
Intercept	-37.6	41.4
Income	*	*
Effective Family Income (Thousand $)	18.1	17.5
Family Size	*	*
Household Size	-35.1	-31.6
Age	*	
Years of Age	23.8	12.3
Student Marital Status		*
Married	23.2	51.7
Separated/Divorced/Widowed	23.2	47.8
Single	Base	Base
Validation		
Student was not Validated	12.1	-13.0
Student was Validated	Base	Base
School Type	*	*
Proprietary, Less than 2 Years	12.8	-34.0
Proprietary, Other	82.1	48.8
Public 2-Year	-21.4	-65.1
Public 4-Year	-20.8	-44.5
Private 2-Year	-25.5	-41.5
Private 4-Year	Base	Base
Institutional Validation		
School Regularly Validated all Students	12.0	3.8
School Does not Validate on Own	Base	Base
Proportion of Explained Variance (R-square)	.159	.196

* Indicates that the characteristic is a statistically significant (p .05) predictor of student error for the model shown.

of student error explained by the independent variables. In each model the R-square, which was statistically significant, was fairly strong.

The first row of the table, the intercept, shows the average error for students with characteristics indicated as the base responses. There are no base responses for income, household size, and age because these are continuous variables which can provide a single estimate of their effect on the model.

The first numerical column in Table 4-30 shows the coefficients of the variables as related to net student error. The next column is for absolute student error. Asterisks (*) indicate a significant relationship between the variable and error. Thus income, household size, age, and school type were significantly related to net student error. Similarly, income, household size, marital status, and school type were significantly related to absolute student error.

The numerical entries in the table represent the difference in average error attributable to being in those categories rather than the base categories shown by the intercept. Thus, for net student error, average error for the three continuous variables and all base categories was about $-38, the intercept. (The base categories were "single," "student was validated," "private 4-year institution," and "school does not validate all students.") For students in public 2-year schools, the average net error would be $-21 lower or $-59. Using the information in the table, the change in amount and direction of average error can be derived for the various combinations of response categories.

For the three continuous variables, we have summarized some additional findings from the regression analysis not included in Table 4-30. On average, both net and absolute student error increased just under $20 for each $1,000 increase in effective family income (AGI plus AFDC/Other nontaxable income, and parent's Social Security benefits, less U.S. taxes paid). Similarly, for each increase of one in family size, student error decreased by $30 to $35. Older students and non-single students showed a tendency toward higher error.

The type and control of institution attended were not only significant in delineating institutional error (Chapter 3), but also student error. However, some of the relationships were different. For example, in Chapter 3 we showed that institutional error in public, 2-year institutions was relatively high. However, student error at these schools was relatively low--in fact absolute student error was lowest in public, 2-year schools. This may be explained by the lower income of these students. Similarly the relatively high student error at private, 4-year schools is probably income-related.

4.4 CONCLUSIONS

Student error accounted for about two-thirds of the net cost of error in the Pell Grant program and was present in more than 62 percent of the cases. The findings summarized in this chapter suggest the directions that efforts to reduce student error might take.

- Of the components of student error, dependency status error accounted for 29 percent of net student error.
- Efforts to reduce dependency status error can be directed exclusively at students who applied as independent.
- Much of the error in dependency status could be reduced by checking whether students were claimed as exemptions by their parents.
- The second largest source of student error, other nontaxable income, was difficult to verify, especially since it was not broken down into its major parts on the application.
- The third and fourth largest sources of student error were household size and number in postsecondary education. These items were prospective when the application was completed and thus inherently error-prone.

CHAPTER 5
VALIDATION

In this chapter, we review the validation process, compare it to previous years, report our findings concerning institutions' compliance with their responsibilities for validation, and report the effects that validation appeared to have had upon student error. We then discuss some of the policy implications which these findings may have in both the short and long term, as a preview to the corrective actions which we will propose in another volume of this report. Key findings are:

- The vast majority of institutions collected the required verifying documentation for their students who were "flagged" for validation by ED. The Federal tax return was the predominant form of documentation.
- Validated students were more likely to revise their Adjusted Gross Income (AGI) and Federal taxes paid initial application data than were non-validated students. Further, those selected for validation and making revisions were more likely to raise their AGI and reduce their taxes paid--revisions that tend to lower eligibility--than were those not selected for validation.
- Among students who made changes to their application, validated students were much more likely to show an increased SAI, leading to a decrease in award. Corrections behavior in this direction was very infrequent among nonvalidated students.
- Most institutions believed that they were unduly burdened by the expanded nature of the 1982-83 validation process. The reasons cited most often were delays, extra work, or confusion due to the late arrival of the Validation Handbook; difficulty in verifying Social Security benefits and Veterans Administration benefits; and difficulty in obtaining documentation from students.

5.1 THE VALIDATION PROCESS

Before reporting the findings of the study regarding the effects of Pell Grant validation, it is useful to review the validation process. Because the discussion of the findings will focus upon the effects of validation in 1982-83 as contrasted to its

effects in the 1980-81 academic or program year, the validation process for 1980-81 is described first, followed by a discussion of the 1982-83 requirements.

5.1.1 The 1980-81 Validation Requirement

In 1980-81, the third year of a mandatory validation activity for the Pell Grant program, approximately 325,000 applicants, or 7.2 percent of the total applicant group, were designated by the central processor for validation by the institution to which they submitted their Student Eligibility Reports (SERs). Selection for validation was both random and on the basis of pre-established criteria (PEC), circumstances that were reasoned to be related to applicant error.

Students selected for validation were advised by letter, as well as by comments on the SER, that validation by the financial aid office at the selected institution would be necessary to obtain payment. Applicants were advised to contact the financial aid office for further information about specific validation procedures and documentation requirements. An asterisk beside the student eligibility index (SEI) was the indication to the financial aid office that payment should not be made prior to validation, although some exceptions were permitted.

Selected cases were to be validated according to procedures contained in the validation manual entitled Basic Educational Opportunity Grant Validation Procedures 1980-81, provided by the Office of Education to all eligible institutions. Applicants selected for validation were required to provide:

- A signed copy of the applicant's (and spouse's, if any and filing separately) IRS 1040 or 1040A Federal income tax return(s) or a statement of nonfiling
- A copy of the parents' 1040 or 1040A return(s), if the applicant was dependent, or a parents' statement of nonfiling
- Specified documentation, as required by comments on the SER, for
  - Medical/dental expenses
  - Elementary/secondary tuition
  - VA Educational benefits
  - Social Security benefits
- A completed Validation Form, either provided by the Office of Education (OE Form 623) or an acceptable alternative.

Required Data Elements to Be Validated

Each selected applicant was to be validated on the following elements contained on the SER:

- Dependency status
- Adjusted gross income
- Federal income tax paid
- Household size
- Number in college
- Other nontaxable income
- Dependent applicant income

Documentation for medical/dental expenses, elementary/secondary tuition, VA educational benefits, and Social Security benefits was required if the associated comment appeared on the SER. Specific documents were required to validate each of the data elements, and were specified in the validation manual, as well as on the Validation Form.

Validation Procedure

Upon submission of the specified documentation, the institutional financial aid office personnel were to compare the documentation values with the corresponding items on the SER. If there were no out-of-tolerance discrepancies, the SER would be certified for payment. Where discrepancies exceeding specified tolerances were noted, the applicant was to correct the appropriate item(s) directly on the SER and sign the certification in Section 4. The aid office was to retain a photocopy of the corrected SER, and the applicant was to send the corrected SER to the central processor. When the reprocessed SER was returned by the applicant, it was to be compared to the photocopy to insure that all needed changes had been processed. If so, the applicant could be cleared and the SER certified for payment. If additional corrections were deemed necessary, the corrections process was repeated. All documentation was to be retained by the institution.

Optional Validation

Institutions could optionally validate applicants not selected by the central processor, as well as data elements in addition to those required by the Office of Education. If optional validation was done, any conflicting information was to be resolved in the corrections process.

Limitations to the 1980-81 Validations

Use of the official Validation Form or a reasonable facsimile offered some assurance that most required elements would be documented in a consistent fashion. There were, however, some shortcomings to the 1980-81 validation procedures.

- If an applicant claimed to be independent, no documentation of parental non-involvement was required. A notarized certification was requested on the Validation Form, but institutions were not allowed to withhold payment if the applicant was unable to obtain a parental signature or refused to do so, provided all other validation requirements were met. Since the requirements for those claiming independence involved only the applicant's (and spouse's, if any) tax return, which does not document whether the parent(s) did or will claim the applicant as an exemption, independent status was not really validated by this process.

- Several of the required data elements were not readily documentable, even with the instructions provided. This was especially critical in the case of other nontaxable income. While the required documents could verify those values which were reported, there was no certainty that all sources had been reported. Other items, like household size and number in college, were likewise difficult to document. In most cases they were prospective estimates and may or may not have been consistent with historical data. Moreover, they were to be accepted as stated unless the institution had contradictory information.

- The procedures dictated to institutions were very detailed and complex, and thus were prone to confusion and misunderstanding. If followed to the letter, they created a substantial burden upon the institutional personnel for what may in many instances have been very marginal corrections and consequent changes in awards

5.2.1 The 1982-83 Validation Requirement

Pell Grant validation in 1982-83 was a significant departure from what had been done in prior years. The proportion of applicants selected for validation was increased

from less than 10 percent, chosen primarily on the basis of PECs, to more than 60 percent, including the initial period of processing when all apparently eligible applicants were selected. During the course of the year, approximately 1.66 million cases were selected for validation. Although the proportion of cases to be validated went up substantially, the requirements for validating each selected case were eased. For most applicants, the institutions were required only to verify a limited number of application values from a copy of the Federal tax return for the previous year (1981) for independent students or the parents of dependent students. Those who did not file a tax return were required to submit a signed statement to that effect.

Required Data Elements to be Validated

Because only the tax return was required for documentation, in most cases the only application items required to be validated were adjusted gross income and U.S. income taxes paid. Applicants whose parents reported Social Security benefits did not agree with data obtained in a tape match with the Social Security Administration were also given a comment on their Student Aid Report (SAR) to provide documentation of that benefit amount. The applicant's Social Security benefits, since they were not a part of the SAI calculation, were not a required validation item.

In addition, if there was information on the tax return that conflicted with certain items on the SAR, those items then became required validation items. For 1982-83, this included interest and dividend income exclusion, untaxed portions of unemployment compensation, other pensions and annuities, and capital gains. While other data elements were not required validation items, institutions were encouraged to check any points of inconsistency between items on the SAR and information available to the institution from any other source.

Validation Procedure

The actual validation procedure was basically the same in 1982-83 as in prior years, as described above. One difference was that the Validation Form or facsimile thereof used previously was no longer required, since the required items were generally obtainable directly from the IRS 1040/1040A. Where Social Security

benefits were to be validated, schools could accept any form of documentation completed by the Social Security Administration.

Optional Validation

With the decrease in required validation items, there was a corresponding increase in optional items. Institutions were encouraged to validate applicants not selected for validation by the central processor (once the 100 percent selection was halted), as well as additional items on ED-selected applicants. The Pell Grant Validation Handbook 1982-83 went to considerable lengths (15 pages) to describe how to accomplish validation of discretionary or optional items.

Limitations to the 1982-83 Validation

The validation procedures for 1982-83 were clearly more straightforward and less complex than in previous years for institutions which did only what was required. There were, however, shortcomings in the 1982-83 validation process.

- Without the required use of the Validation Form, applicants claiming independence did not have to provide even a notarized certification of authenticity from their parent(s). The only required documentation in such cases was the applicant's own Federal tax return, which does nothing to verify that the parent(s) did not claim the applicant as an exemption, nor does it show anything about the accuracy of the other criteria for independent status. The removal of the mandatory $400 per person minimum annual income test used in 1980-81 further diluted the institution's ability to identify possible parental financial support that would not be reflected on the applicant's own 1040/1040A. Thus, for all practical purposes, there was no required validation of dependency status.

- The items identified earlier as difficult to validate, such as household size, number in college, and other income and benefits, were no longer required items. These items were checked only to the extent that institutions elected to do so.

- The mandatory procedures were probably less confusing to institutions, as noted earlier, except where Social Security benefits were concerned. Because of a change in the treatment of the student benefits, as well as the phase-out of those benefits, and potential difference in what was included in the SSA documentation and what was to be reflected on the SAR, there was some difficulty in understanding how the validation of these benefits was to be performed.

5.2 EFFECTS OF VALIDATION

Validation of Pell Grant application data came about because the financial aid community, the Department of Education, and other interested parties were concerned about the accuracy of the data being used to allocate several billion dollars annually. Although there is a difference of opinion as to the most appropriate way to achieve the desired accuracy, there is little debate that some controls are necessary to assure that the proper applicants are receiving benefits and that the overall cost of the Pell program is contained by making payments only to eligible applicants. The basic question remains: "Is validation an effective tool for reducing student error?" A secondary question to be answered is: "Was the expanded validation effort in 1982-83 more effective than those in past years?" The following discussion, with accompanying data, attempts to address both of these questions. We first look at the distribution of student error of various types, comparing validated and nonvalidated cases. Next, we assess the changes that take place in selected application values between first and most recent SARs, presumably reflecting all corrections made as a result of validation. We then review the effect of validation tolerances upon error correction.

5.2.1 Distribution of Student Error Among Validated and Non-Validated Applicants

Earlier in this volume, the various types of student error were defined and presented as an indication of the incidence of misreporting on the Pell Grant application. In this subsection, we look at the distribution of that error among validated and nonvalidated applicants as one piece of evidence to answer the question of whether or not validation makes a difference.

Table 5-1 displays net student error, student overaward, and student underaward according to whether or not the sampled case was validated by the institution. The data were further delineated between those selected and not selected for validation by ED. Among those selected for validation and actually validated, there was no difference in net error between those selected by PECs and those selected randomly, bearing in mind that random selection during the early part of the processing cycle included all applicants not selected on the basis of PECs. That validation selection was somewhat discriminating can be seen in the lesser percentage of cases in error between the two "not selected" categories.

TABLE 5-1

AMOUNTS AND RATES OF STUDENT ERROR:
VALIDATED VS. NONVALIDATED STUDENTS

	Validated			Not Validated	
	PEC Selected (Weighted N = 199)	Randomly Selected (Weighted N = 1746)	Not Selected (Weighted N = 679)	Selected (Weighted N = 251)	Not Selected (Weighted N = 751)
Net Student Error					
Percentage with Error Greater than $2	47.1	46.8	36.7	24.6	33.6
Mean Net Error Per Recipient with Error ($)	209.5	208.1	201.4	323.1	243.1
Student Overaward					
Percentage with Overaward	34.5	36.9	27.5	18.4	26.6
Mean Overaward ($)	439.5	329.7	361.7	482.0	358.9
Student Underaward					
Percentage with Underaward	12.5	9.9	9.2	6.2	7.1
Mean Underaward ($)	-423.3	-245	-276.0	-145.7	-192.4

When overaward and underaward were considered separately, the discriminating ability of the PECs was more apparent, not so much in terms of cases in error, but clearly in terms of the size of errors identified. While the percent of cases in error was clearly less in the "not selected" groups, the mean overawards were not appreciably different from those of cases selected for validation.

The data in Table 5-1 demonstrate that cases selected for validation are more error-prone, but the distinction is not as great as might be expected, perhaps due to the 100 percent validation selection during the early part of the year.

Table 5-2 looks at the issue in a slightly different fashion. When one considers AGI error by itself, validation of ED-selected cases did make a difference, showing a difference in mean error of $5.30 per case for those selected but not validated and $8.50 per case for those neither selected nor validated. When all types of error were aggregated, however, there were mixed results. Absolute case error and absolute student error tended to be greater for validated than for nonvalidated students. Since the difference was not in AGI, however, it may be presumed to be in items not required to be validated.

It is interesting to note that mean institutional error was less for validated students, both selected and nonselected, than for nonvalidated recipients, even though validation was aimed at student error. One can only speculate that institutional personnel are more careful about the accuracy of their own processing activities on a validated student because they have been singled out for special attention.

5.2.2 Changes in Application Data during the Course of the Processing Cycle

With all the error remaining after, presumably, most of the validation activities had been completed at the institution, one might be tempted to ask: "Did validation do any good with respect to lowering error?" If the amount of change in adjusted gross income, Federal income taxes paid, and Student Aid Index during the course of the processing cycle was any indication, the answer had to be "yes". It should be noted that not all changes were initiated by validation. Students submit corrections for a variety of reasons, including form completion errors, keying errors at the processor, and changes in circumstances, among others. However, the pattern of changes submitted by those selected for validation was so much different than that of

TABLE 5-2

MEAN AMOUNTS OF ERROR:
VALIDATED VS. NONVALIDATED STUDENTS

	Selected for Validation		Not Selected for Validation	
	Validated	Not Validated	Validated	Not Validated
Net AGI Error				
Mean	$2.00	$7.30	$12.40	$10.50
Weighted N	1816	224	634	722
Absolute Case Error[a]				
Mean	$248.80	$240.20	$216.40	$227.40
Weighted N	1938	251	676	750
Net Case Error[a]				
Mean	$132.00	$150.00	$91.00	$138.00
Weighted N	1938	251	676	750
Absolute Student Error[b]				
Mean	$152.70	$99.70	$125.40	$109.00
Weighted N	1936	246	676	750
Net Student Error[b]				
Mean	$98.00	$81.20	$74.20	$81.80
Weighted N	1936	246	676	750
Absolute Institutional Error[a]				
Mean	$118.10	$116.60	$121.70	$140.40
Weighted N	1932	246	676	750
Net Institutional Error[a]				
Mean	$38.60	$68.30	$15.70	$62.70
Weighted N	1932	246	676	750

[a]Treating SEP/FAT/SAR error cases as ineligible.

[b]Treating SEP/FAT/SAR error cases as eligible.

nonselected applicants that the impact was unmistakable. Table 5-3 reports the changes in application data for AGI and Federal income taxes paid from the first to the most recent SAR at the time of our spring data collection. Of those applicants making one or more corrections to their application data, a significantly larger proportion of applicants selected for validation submitted corrections to their original application data than did those who were not selected for validation. As additional evidence, there was a significantly higher proportion of cases among selected applicants who revised their AGI upward or their taxes paid downward than was the case with nonselected applicants. These were not the expected directions of applicant-initiated corrections, without at least the threat of validation.

Table 5-3 also points up the discriminating nature of the PEC selection criteria, especially for identifying unreported AGI. While the percentage of PEC-selected applicants submitting upward adjustments to AGI was noticeably higher than for the randomly selected cases, the mean and median increases were substantially higher, suggesting that the PECs identify the higher error cases very well. The same can be said for the identification of the need for downward adjustments to taxes paid, although the difference was less dramatic.

Table 5-3 also suggests that institutions were fairly effective in identifying non-selected applicants for optional validation. The nonselected, but validated group displayed considerably more correction activity than the nonselected, nonvalidated category.

Table 5-4 translates the corrections activity to changes in SAI. The pattern was essentially the same as with AGI and taxes paid. Selected and validated cases not only showed more corrections action, but most of that correction resulted in higher SAI. Non-selected cases showed over 50 percent correction activity, but most of those changes resulted in lower SAI values, as might be expected in applicant-initiated corrections.

Error Removed by Validation

Thus far, we have seen that validation has had the expected effects on error, especially for those application items that represent the focus of validation efforts. A summary of these findings, abstracted from Tables 5-2, 5-3, and 5-4, shows the following:

TABLE 5-3

CHANGE[a] IN ADJUSTED GROSS INCOME AND TAXES PAID:
VALIDATED VS. NONVALIDATED STUDENTS

	Validated			Not Validated	
	PEC Selected	Randomly Selected	Not Selected	Selected	Not Selected
Change in Adjusted Gross Income					
Weighted N	82	657	261	26	157
Percentage With Increase	49.1	31.7	13.5	16.4	4.5
Mean Increase ($)	6426	3062	3869	2351	1821
Median Increase ($)	4062	1264	1625	2460	616
Percentage With No Change	41.7	50.3	78.0	66.9	92.5
Percentage With Decrease	9.2	18.0	8.5	16.7	3.0
Mean Decrease ($)	-6423	-2704	-10783	-4307	-22790[b]
Median Decrease ($)	-3722	-980	-6252	-2800	-14341[b]
Change in Taxes Paid					
Weighted N	83	656	254	27	158
Percentage With Increase	18.1	18.6	9.0	7.6	3.1
Mean Increase ($)	634	489	597	425[b]	429[b]
Median Increase ($)	394	259	380	425[b]	105[b]
Percentage With No Change	42.1	52.4	81.0	80.3	93.8
Percentage With Decrease	39.8	29.0	10.0	12.1	3.1
Mean Decrease ($)	-865	-682	-1060	-4697[b]	-753[b]
Median Increase ($)	-597	-387	-486	-4707[b]	-1119[b]

a Change from first application values to last application values. Excludes students for whom only one SAR was obtained from the central processor.

b Means and medians based on small numbers; may be misleading.

TABLE 5-4

ABSOLUTE AND NET EFFECTIVE SAI CHANGE[a]
VALIDATED VS. NONVALIDATED STUDENTS

	Validated			Not Validated	
	PEC Selected (Weighted N = 53)	Randomly Selected (Weighted N = 645)	Not Selected (Weighted N = 103)	Selected (Weighted N = 30)	Not Selected (Weighted N = 41)
Overall SAI Change (%)	60.2	61.3	51.6	23.9	55.5
Decrease in SAI (%)	7.8	17.7	41.3	6.9	49.8
No Change in SAI (%)	39.8	38.7	48.4	76.1	44.5
Increase in SAI (%)	52.4	43.6	10.3	17.0	5.7

[a] Change from first application value to last application value. Excludes students for whom only one SAR was obtained from the central processor.

- Net AGI error is 81 percent lower among students selected for validation and validated compared to those neither selected nor validated. (Table 5-2)

- Nearly half of the PEC-selected validated cases and one-third of the randomly selected validated cases show increases in AGI, compared to less than five percent of those neither selected nor validated. Average increases for the first two groups are also much larger than that of the last. Increases in AGI lead to decreased eligibility and award. (Table 5-3)

- About 40 percent of the PEC-selected validated cases and almost 30 percent of the randomly selected validated cases have decreases is U.S. taxes paid, compared to only 3 percent of those neither selected nor validated. Decreases in taxes paid lead to decreased eligibility and award. (Table 5-3)

- On the average, almost one-half of validated student versus 10 percent or less of nonvalidated students show an increase in SAI from initial to final application. Since increases in SAI lead to decreased awards, it seems quite reasonable to attribute change in that direction, which is counter to the self-interest of students, primarily to the affect of validation. It should be further emphasized that the greater tendency of validated students to have an increase in SAI is nearly as strong for those randomly selected as for those who were PEC-selected.

Together these findings support the effectiveness of validation in removing error. Considering that the efforts of validation were unlikely to lead to any change in several of the highest sources of error--notably, dependency status, other nontaxable income, household size, number in postsecondary education, and home equity--it is not surprising that, despite the effectiveness of validation, substantial error remains after validation. This remaining error is discussed in the following section.

5.2.3 The Effect of Validation Tolerances upon Error Correction

With all the corrections activity discussed above, much of it presumably caused by validation selection, one might ask why there was so much student error remaining after validation, at least by the definitions used in this study. There are a number of potential explanations, including:

- Not all corrections result in agreement with the documented values used in the study to calculate the "best" SAI.

- The Pell program validation procedures allow specified application values to deviate from the documented values by as much as $300 for dependent

cases and $200 for independent cases; thus, some variance which leads to payment error is, by Federal policy, ignored.

- The validation procedures for 1982-83 required verification only for AGI, taxes paid, and in specified cases, parents' Social Security benefits and selected other items if different from information contained in the documentation on hand; thus, many of the error-prone items found in this study were not routinely validated and discrepancies remained in them.

This section focuses upon the impact of the validation tolerance levels upon error correction.

The Reason for Validation Tolerances

The validation procedures used for the past several years have provided a specified tolerance level for certain data elements being validated. Application values falling within these tolerances have been defined as acceptable for validation purposes and correction has not been required. The tolerance levels have varied somewhat from year to year, but were established as a best estimate of the amount of variance that would have little or no effect on the amount of the final award eligibility. Thus, the objective of the tolerance policy was to ignore data discrepancies that would not likely make a difference in the amount paid to the recipient, and focus resources upon those cases where award amounts were affected. Several factors have made this approach desirable, if not necessary:

- The burden upon the applicant to process inconsequential corrections
- The Federal cost of processing such inconsequential corrections
- The increased length of processing time, and thus delay in payment, which would result from these inconsequential corrections
- The burden upon the schools to initiate and monitor such corrections.

Error Rates for Discrepancies Exceeding Tolerances

When one reviews the tables regarding overall student error, overaward, and underaward presented earlier in this report, it is not unreasonable to ask why so much error remains after validation. It might be concluded that the institutions are not doing a reasonable job initiating corrections based upon the documentation provided by

validated students. However, if one looks at the same data, but with cases with within-tolerance values of AGI and taxes paid factored out, a much different picture is presented. Table 5-5 shows the percentage of cases where after-validation data still exceed the validation tolerances, for both dependent and independent recipients. Remember that previous error tables included all types of error, while this one reflects only AGI and taxes paid, the only universally required items to be validated. The percentage of cases still in error is noticeably improved.

Although validation data do not show the clear-cut improvement over non-validated cases one might expect to find, there clearly is a reduction in error with regard to AGI and taxes paid when validation tolerance is factored into the analysis.

Another view of the effectiveness of validation and the impact of tolerances is provided by Table 5-6. The data on AGI and taxes paid are simply the aggregation of the validated cases in the previous table and show that over 90 percent of the validated cases had application data in agreement or within tolerance of the best values derived by this study. For selected nonvalidated items, however, the story is a different one. From 15 to 47 percent of the cases had application values exceeding tolerance for other income and benefits and parental Social Security benefits. The variance of other income and benefits is not particularly surprising, in that it was neither a required validation item, nor an easy one to validate routinely with documentation required in 1982-83. The variance of parental Social Security benefits item is less understandable. However, the central processor selection criteria did not request validation for all cases having parental Social Security benefits. Presumably, the study procedures discovered more variance than was identified by the validation selection process. Additionally, Social Security benefits are not easy to allocate among the various Social Security programs and multiple beneficiaries, so it is possible that the validation process overlooked some erroneous cases that should have been corrected but were not.

Payment Consequences of Using Tolerance Levels

This discussion of tolerance effects would not be complete without an exploration of the payment consequences of limiting corrections to cases outside the tolerance levels. If the tolerance levels had been perfectly constructed, there would

TABLE 5-5

PERCENTAGE OF CASES HAVING DISCREPANCIES IN AGI AND TAXES PAID THAT EXCEED ED-ESTABLISHED VALIDATION TOLERANCES: VALIDATED VS. NONVALIDATED STUDENTS

	Validated			Not Validated	
	PEC Selected	Randomly Selected	Not Selected	Selected	Not Selected
Dependent Students					
Weighted N	106	877	311	54	178
Percentage Whose Documented AGI was Outside of $300 Tolerance (%)	9.0	6.4	11.6	14.4	6.6
Percentage Whose Documented Taxes Paid was Outside of $300 Tolerance (%)	11.3	5.9	5.8	9.9	4.9
Independent Students					
Weighted N	41	334	137	44	92
Percentage Whose Documented AGI was Outside of $200 Tolerance (%)	15.9	13.2	13.8	15.6	16.2
Percentage Whose Documented Taxes Paid was Outside of $200 Tolerance (%)	5.6	7.3	6.8	10.0	8.3

TABLE 5-6

DIFFERENCES BETWEEN SAR AND DOCUMENTED VALUES
FOR SELECTED APPLICATION ITEMS:
CASES SELECTED FOR VALIDATION

	Cases with Differences Outside of Tolerance (%)	*Cases with* Differences Within Tolerance (%)	Cases with No Difference (%)	Cases with Documentation	Total Number of Cases*
Adjusted Gross Income					
Independent	13.5	21.9	64.6	376	664
Dependent	6.7	19.0	74.3	984	1209
Total	8.5	19.8	71.7	1359	1873
U.S. Taxes Paid					
Independent	7.1	7.8	85.0	366	663
Dependent	6.5	10.4	83.1	967	1208
Total	6.6	9.7	83.7	1334	1871
All Other Income and Benefits					
Independent	14.2	20.5	65.3	325	663
Dependent	31.0	22.6	46.4	879	1209
Total	26.5	22.0	51.5	1204	1872
Parental Social Security Benefits					
Dependent	46.8	32.2	21.0	37	1209
Sum of Items					
Independent	34.1	29.6	36.3	423	663
Dependent	45.3	33.3	21.4	1037	1208
Total	42.0	32.2	25.8	1460	1871

*Excludes those whose application dependency status was not in agreement with documentation at the institution.

have been no payment consequences, as the cases where eligibility remained constant would have been exempt from correction and the cases where eligibility was affected by the erroneous data would have been forced to process corrections. Unfortunately, the determination of SAI and scheduled payment is too complex to be supported by a simplistic tolerance level or even the more sophisticated zero-SAI charts provided to institutions to approximate the effect of data changes for cases with a zero SAI.

Table 5-7 displays the payment consequences of both within-tolerance and out-of-tolerance data discrepancies for all items. It is readily apparent that the tolerance levels did not eliminate all of the inconsequential corrections, nor did they require correction of all the consequential ones.

In total, 72 percent of the cases within tolerance would have had SAI change had corrections been required, and two-thirds of those changes would have resulted in net payment change totaling an estimated $26 million. On the other hand, 77 percent of the cases outside tolerance levels had changes sufficient to change SAI, and 72 percent of those resulted in payment changes totaling approximately $38 million.

It is interesting to note that the majority of the out-of-tolerance cases experiencing no SAI change as a result of validation had a zero SAI initially and retained that index. Only a few no-change cases had positive SAIs initially. On the other hand, 27 percent of the SAI-change cases had no payment change, either because that change was so slight as to stay within the same cell of the payment table or the change was not realized because of the half-cost limitation.

5.3 INSTITUTIONAL COMPLIANCE WITH VALIDATION REQUIREMENTS

Most of the responsibility for Pell Grant validation has, since its inception, rested with the postsecondary institutions which the applicants attend. The Department of Education has assumed some responsibility by matching applicant data against other Federal data bases, such as Social Security and Veterans Administration, but resolution of discrepancies is largely left to the affected institution. Most aspects of validation of applicants attending Alternate Disbursement System (ADS) institutions have been traditionally handled by Department of Education personnel. For 1983-84, ADS institutions have been given the option of doing the validation themselves.

TABLE 5-7

PAYMENT CONSEQUENCES OF APPLICATION DATA DISCREPANCIES:
CASES FLAGGED FOR VALIDATION BY IN-TOLERANCE AND OUT-OF-TOLERANCE DIFFERENCES

	Independents	Dependents	Total*
Total With Documentation			
N	513	1427	1940
Weighted N	578	1543	2121
Percentage of All Cases	44.1	72.1	61.5
Percentage With In-Tolerance Differences	35.3	31.8	32.8
Percentage With SAI Change	37.3	86.5	72.1
- With No Payment Change (%)	49.6	32.0	34.7
- With Payment Change (%)	50.4	68.0	65.3
Mean Net Payment Change ($)	211	96	109
Program-Wide Net Payment Change ($ Millions)	6	20	26
Percentage With Out-Of-Tolerance Differences	38.4	46.7	44.5
Percentage With No SAI Change	55.4	12.0	22.2
- With Zero SAI (%)	95.0	86.0	91.3
- With Positive SAI (%)	5.0	14.0	8.7
Percentage With SAI Change	44.5	88.0	77.8
- With No Payment Change (%)	28.5	27.4	27.6
- With Payment Change (%)	71.5	72.6	72.4
Mean Net Payment Change ($)	278	70	97
Program-Wide Net Payment Change ($ Millions)	14	24	38

* Excludes those whose application dependency status was not in agreement with documentation at the institution.

Obviously, under such an arrangement, much of the effectiveness of the validation effort was dependent upon how well institutions carried out these responsibilities. This study was designed to address this question in a number of ways, including:

- A preliminary assessment of institutional compliance in the fall of 1982
- An anecdotal data collection in the fall of 1982
- A self-assessment of institutional burden and related problems resulting from the 1982-83 validation process, collected via the institutional interviews in the spring of 1983
- A more comprehensive analysis of compliance drawn from the applicant data collected in the spring of 1983.

5.3.1 Fall 1982 Analysis of Institutional Compliance

Because of the substantive change in validation procedures for 1982-83, it was important to assess institutional ability to provide the required validation activities as early in the year as possible. Consequently, a review of these efforts was included in the initial institutional visits to select the student or applicant sample for the overall assessment effort. During the course of selecting that sample, Advanced Technology field staff reviewed the files of selected applicants to determine:

- If the applicant had been flagged for validation
- If complete documentation was available
- The forms of documentation provided
- The extent of agreement between SAR values and available documentation
- The SAI changes that would result from the use of validated data, and their potential payment consequences
- The extent to which institutions were validating nonflagged recipients and non-required application items.

The results of this initial data collection were first reported to the Department in December, 1982. In February, 1983, a final document entitled Preliminary Report on Assessment of 1982-83 Pell Grant Validation Procedures was submitted. This report was based upon the data available for a statistically representative sample of 3,490 Pell Grant recipients at 317 RDS institutions at the time of the fall, 1982

institutional visits. These data obviously were subject to further validation activities and subsequent applicant-initiated corrections, but the preliminary results can be summarized as follows:

- **The vast majority of institutions collected the required verifying documentation for their students who were "flagged" for validation by ED.** Only 6 percent of all flagged recipients did not have the required documents in their files as of fall, 1982.

- **Approximately 76 percent of the flagged recipients satisfied the validation requirement by providing a signed copy of their Federal tax return;** 2 percent submitted an acceptable alternative to a tax return; 15 percent signed a statement asserting that no tax return was, or would be, filed; and 1 percent had no verifying documentation because they were exempt from validation.

- **The great majority of institutions appeared to be identifying incorrect application entries in the cases flagged for validation and getting them corrected.** AGI was correct in 89 percent of the cases and U.S. taxes paid was correct in 85 percent of the cases when values from verifying documents were compared with values on the application, as indicated on the flagged recipient's most current Student Aid Report (SAR).

- **For most of the documented cases, the application item discrepancies were small.** Only 7 percent of the documented flagged cases had item discrepancies that when taken individually or summed exceeded the ED-established tolerances. AGI exceeded tolerance in 3 percent of the cases; U.S. taxes paid also exceeded tolerance 3 percent of the time.

- **Approximately two percent of the documented flagged cases had out-of-tolerance differences which would lead to a change in the student's expected award.** For the 1.7 million recipients represented by the sample, these differences would translate into an estimated net overpayment of $3.4 million. This dollar figure can be viewed as an estimate of the level of institutional noncompliance as of fall, 1982.

- **Approximately 6 percent of the documented flagged cases had differences within tolerance which would lead to a payment change.** These differences would translate into an estimated net overpayment of $1.6 million as of fall, 1982. This dollar figure can be viewed as an estimate of the dollar savings to the program not captured as a result of the validation tolerances in place at the time.

- **Public institutions appeared to be most diligent in complying with the validation regulations, followed in order by private and proprietary institutions.** Roughly 5 percent of the files of flagged students at public institutions were incomplete, while 8 percent of the private institution files and 19 percent of the proprietary institution files were incomplete. The difference in proprietary school compliance may, however, reflect the more frequent, and thus more recent, start dates of their recipients rather than any greater lack of diligence.

- **Many institutions were voluntarily taking steps to improve the quality of application data.** Institutions collected a Federal tax return from 28 percent of their unflagged recipients, an alternative to a tax return from 1 percent, and a statement saying no tax return was, or would be, filed from 10 percent. A file comparison between the validating document and the student's SAR showed that for these unflagged cases, AGI was accurate 89 percent of the time and U.S. taxes paid was correct 91 percent of the time.

- **Institutions rarely verified application items that are optional for validation, even for flagged SARs.** For example, the asset items were documented in less than 0.2 percent of the flagged cases.

- **Early indications were that institutions in 1982-83 were less likely to be out of compliance with the validation requirements than institutions in 1980-81.** Approximately 11 percent of the flagged recipient files reviewed during the 1980-81 quality control study had no verifying documentation of AGI. In roughly 10 percent of the files, U.S. taxes paid was not documented. In 1982-83, only 4 percent had no documentation of AGI and only 6 percent were missing documentation of U.S. taxes paid.

The preliminary report provided a number of statistical tables to support the above conclusions. Those figures are not being reported here because they have been superseded by more complete data.

5.3.2 Fall, 1982 Anecdotal Data Collection

During the field work, many financial aid administrators (FAAs) offered their complaints and suggestions to the data collectors who visited their institutions. The following comments stem from two sources. The first are concerns voiced by FAAs during the sampling and compiling of data in the field. The other source is a summary of the comments provided by the data collectors during a debriefing held on December 11, 1982. The comments have been organized by the following five topics:

- Administrative problems
- Communication problems with ED regarding all issues, including validation
- Problems with the Pell Grant application process
- Problems with validation procedures
- Recommendations to improve validation procedures

Overview

The majority of FAAs who commented from the sampled institutions acknowledged the positive effects of the expanded validation effort; however, they believed that the many problems and delays caused by costly, inconsistent, and unrefined validation procedures cannot be overlooked. A variety of factors, ranging from overburdened financial aid office staffs and inadequate communication with ED, to difficulty in obtaining documentation from government agencies, contributed to the dissatisfaction of many FAAs. These complaints and suggestions were targeted at program inefficiency and not at the merits of the validation effort. In fact, many FAAs considered the problems associated with increased validation inevitable and actively sought to resolve them. One FAA's remark that "the new validation is a burden, however, it is acceptable if it does provide more money for the neediest students" summed up the attitude of many. It is important to note that FAAs who previously had validated 100 percent of their students of their own volition had significantly fewer complaints and reacted positively to the expansion of validation.

During the debriefing, the data collectors reinforced and expounded upon the opinions expressed by FAAs concerning expanded validation. Some of the data collectors reported that small schools could handle 100 percent validation but that large schools were overwhelmed. Others, however, found that "it depends very much on the personality of the financial aid officer and their efficiency, on how they view their job." Many institutions were already doing validation similar to that required by the Pell Grant program for all their aid recipients to control institutional funds (especially at private institutions) or in response to the requirements of state programs. Many proprietary schools, aware that they are suspected of waste or fraud because of a few well-known cases, were especially scrupulous. Only one college was reported to disagree fundamentally with validation. As one data collector observed, "I don't think their argument is with validation itself. I pinned them down on it; it's the process. They all, I think, see the need of validation."

Generally, FAAs stressed the need for more money to alleviate administrative burdens, for clear and explicit guidelines to eliminate inconsistent regulations and forms, and for timeliness of ED changes and announcements. As one FAA asserted: "Application and validation procedures result in declining student participation,"

undermining the goals of the Pell Grant program. Because problems of validation ultimately harm student applicants, FAAs saw the need for immediate improvements.

The specific problem areas cited by FAA's are listed below. For each of the five problem areas, we summarize the major findings.

Administrative Problems

- Despite the general acceptance of expanded validation, many FAAs found costs, paperwork, and administrative burdens excessive.
- FAAs agreed with the need to validate, but faced difficulty in funding positions to take care of the work if it continues at high levels.
- FAAs were uncertain if much money had been saved by validating because of the expense of reprocessing and the cost to institutions.

Communication Problems with ED regarding All Issues, Including Validation

- There was a general expression of the need for clear and timely communication from ED. A specific example of this was the need for earlier delivery of the Validation Handbook, which should state, in simple language, the institution's responsibilities.
- Mid-year changes in regulations or payment schedules caused confusion and unnecessary burden.
- Retroactive changes by ED must be avoided.
- Institutions already validating 100 percent seemed to adjust more easily to ED's changes. The situation was different and more serious for other institutions.
- There was a need for continued training and workshops, especially on tax forms. Training and communication from ED were considered less reliable than private sources, such as NASFAA.
- FAAs believed that there was a lack of support for their institutions by ED as a result of poor communication. FAA credibility was damaged by conflicting policy or regulatory interpretations by ED staff: a student who was told one thing by his FAA could get a different answer by calling ED. This was particularly the case with payment options and validation. Another example was the perception that ED did not follow through on cases turned over to it.

Problems with the Pell Grant Application Process

- There was a need for more explicit directions for the applicants, more comprehensive instructions for FAAs, and improvement of the edit system.
- The comments section of the SAR was another area where instructions could have used improvement, since students did not always read it.
- There were many problems with defining and determining dependency status, particularly for students who had somewhat unusual circumstances. Several inequities of the current definition were mentioned.
- FAAs asked that reporting requirements for other income be clearer and more specific.
- The confusion over completing the application caused some students to hesitate filling out the form and fear the consequences of a mistake. There was also a concern about confidentiality.
- FAAs considered the SAR reprocessing delays to be one of the largest problems they faced. They saw a need for refining the edit system as well, and would like the toll-free number for questions reinstated.

Problems with Validation Procedures

- From the viewpoint of many FAAs, validation should be a means to correct and prevent gross discrepancies on high priority items, and not to be used as a control or policing mechanism for relatively minor ones.
- Government agencies, namely the Social Security Administration, the Internal Revenue Service (IRS), and the Veterans Administration (VA), were targets of blame for delays in the validation process. Local social service agencies seemed to be particularly notorious for long delays in documenting welfare benefits received by students.
- Regulation changes regarding Social Security and VA benefits contributed to increased workload and delays in disbursing Pell Grants. Retroactive changes were the chief source of complaints.
- Along with delays caused by regulation changes, FAAs had problems obtaining and using documentation, particularly tax returns. Many FAAs suggested that ED require the 1040, 1040A, or an alternative as part of the Application for Federal Student Aid. Others suggested that insufficient attention was being given to documenting those who did not file tax returns.

- There was also the problem of documenting a student's past financial aid and obtaining a financial aid transcript. FAAs found themselves in a peculiar situation, since they had no way of knowing if a student had attended another school and received financial aid. Many pointed out that a student in default at one school can still get a Pell Grant at another.

- FAAs commented that many families, especially low-income families, do not keep documents and cannot complete validation. This was of particular concern to FAAs since they wanted to assist in getting money to the neediest students.

- Some FAAs believed that the present emphasis on documentation seems to contribute to abuses of the Pell Grant program, with cheating becoming institutionalized.

Recommendations to Improve Validation Procedures

- There was general agreement on the usefulness of simply requiring every student to submit a copy of his tax return (and his parents', if dependent) with the SAR.

- A second discussion focused around incentives for institutions. Under current regulations, an institution that discovers overawards saves the Federal government money, but does not help the institution or its honest or accurate applicants. Allowing the institution to keep some of the savings for administrative costs was suggested as an incentive for doing 100 percent validation and doing it well.

- A third suggestion was to combine extensive validation for a smaller number of error-prone students with validation of only a small number of items--no more than four--for everyone else.

5.3.3 Self-Assessment of Institutional Burden and Other Problems

The anecdotal data in the preceeding subsection were collected during or shortly after the intensive effort on the part of institutions to comply with the 1982-83 validation requirements. Because of the ad hoc nature of the fall, 1982 institutional visits, there was no opportunity to develop quantifiable data on institutional burden. However, it is safe to conclude that a majority of institutional financial aid personnel felt that they were unduly burdened by the expanded nature of the validation process, at least at the time of our fall visits.

In order to quantify the institutional perceptions of the burden of validation, the Institutional Questionnaire (IQ) administered in the spring of 1983 asked a number of questions about the impact of the validation effort upon the institution. As can be

seen in Table 5-8, only 18 percent of the IQ respondents considered the 1982-83 validation process to be "no problem." The 72 percent who did consider it to be a problem reported a number of different reasons. The most frequent (26 percent of respondents) problem reported was the delay, extra work, or confusion brought about by the late arrival of the final instructions via the Validation Handbook. Difficulty experienced in getting documentation for Socal Security benefits caused a problem for 19 percent of the respondents, followed by difficulty getting documentation from students (17 percent), verifying VA benefits (11 percent), and delays or difficulties associated with recalculating awards due to mid-year changes in treating VA benefits or the revision to the payment schedule (9 percent). Seven percent of the respondents reported difficulty understanding the validation instructions and procedures once they were issued. Delays or difficulties getting tax returns from the Internal Revenue Service affected six percent of the sampled institutions. A variety of other problems were reported by five percent or less of the respondents.

A comparison of the anecdotal comments and the problems reported in Table 5-8 suggests that the passage of time between the first and second visit moderated the perceived impact of the expanded validation requirement, as might be expected. When the questions were more specific, however, such as the occurrence of unusual delays in making Pell Grant payments (Table 5-9), or the creation of an unusual burden on the financial aid staff (Table 5-10), a higher response rate was received even in the spring when the worst was presumably over.

Furthermore, the response to the questions of delay and burden was not evenly distributed across all institutions. Table 5-9 displays the fact that private 4-year institutions felt the most delays, in percentage of institutions affected, percentage of students affected, and mean number of weeks delayed. Public 4-year institutions were the next most affected, followed by private 2-year, public 2-year, and proprietary institutions respectively. To the extent that one can generalize the financial aid processing calendar based upon type and control of institution, the more in advance of the start of the enrollment period the work of the financial aid office takes place, the more frequent and more lengthy the delays reported.

Table 5-10 shows that the distribution of burden also varied according to type and control of institution, with the greatest burden being borne by public 4-year institutions, followed by private 4-year schools, 2-year colleges (both public and

TABLE 5-8

PROBLEMS EXPERIENCED BY SAMPLED INSTITUTIONS
AS A RESULT OF VALIDATION

Response	Percentage of Financial Aid Administrators With Reponse (N=311)
No Problems	18%
Problems	72%
Delays, extra work, or confusion due to late arrival of Validation Handbook	26%
General difficulty in verifying Social Security benefits	19%
General difficulty obtaining documentation from students	17%
General difficulty verifying Veterans Administration benefits	11%
Delays or difficulties associated with recalculating awards due to VA regulation change and/or payment schedule change	9%
Instructions unclear/uncertainty about which items to validate/uncertainty about procedures overall	7%
Delays or difficulties obtaining copies of tax returns from the IRS	6%
High volume of validation cases placed undue burden on financial aid office	5%
General difficulty verifying other nontaxable income (all other income and benefits)	5%
Difficulty verifying interest/dividend exclusion	4%
Difficulty obtaining signatures on tax returns	4%
Difficulty dealing with the Social Security Administration in obtaining documentation	3%
Delays in receiving corrections from processor	3%
Difficulty explaining procedures/changes in procedures to families	3%
Tolerance limits were inappropriate	2%
Getting students to report taxes paid rather than taxes withheld	2%

TABLE 5-9

FREQUENCY AND MAGNITUDE OF REPORTED PAYMENT DELAYS TO PELL GRANT RECIPIENTS RESULTING FROM VALIDATION BY TYPE AND CONTROL OF INSTITUTION

	Public		Private		Proprietary	
	4 Year (N=105)	2 Year (N=87)	4 Year (N=75)	2 Year (N=10)	2 Year (N=13)	Less Than 2 Year (N=20)
Percentage of Institutions in Sample Reporting Unusual Delays in Making Pell Grant Payments	70.5	42.5	70.7	40.0	23.1	30.0
Mean Number of Students Delayed[a]	776	180	246	119	41	91
Percentage of Students Delayed to Total Number of Students at the Institution Selected for Validation[a]	40.4	28.4	56.5	40.8	49.9	19.1
Mean Number of Weeks Delayed[a]	6.3	5.3	8.0	6.2	4.7	5.2

[a] As reported by institutions. Excludes some institutions which reported delays but could not provide specific details on one or more of the questions.

TABLE 5-10

FREQUENCY WITH WHICH INSTITUTIONS REPORTED THAT VALIDATION CAUSED AN UNUSUAL BURDEN ON THEIR STAFFS BY TYPE AND CONTROL OF INSTITUTION

	Public		Private		Proprietary	
	4 Year (N=105)	2 Year (N=87)	4 Year (N=75)	2 Year (N=10)	2 Year (N=13)	Less Than 2 Year (N=20)
Percentage of Institutions in Sample Reporting That Validation Caused an Unusual Burden on Their Staffs	86.7	58.6	82.7	60.0	46.2	40.0
For Those Reporting Burden						
Percentage Reporting That Additional Staff Had to Be Hired Due to Validation	5.6	2.0	4.8	0.0	0.0	12.5
Percentage Reporting Increases in Staff Overtime due to Validation	17.8	18.4	17.7	20.0	60.0	12.5
Percentage Reporting That Other Staff Functions Had to be Dropped Due to Validation	72.2	75.5	66.1	60.0	40.0	50.0
Percentage Reporting That Validation Created Other Types of Hardships on Their Staffs	4.4	4.1	11.3	20.0	0.0	25.0

private), and proprietary institutions in that order. In this instance, type and control may be functioning as a proxy for average number of Pell applicants per institution, rather than as a characteristic of its own. All institutions except 2-year proprietary schools used the deferral of other staff functions as the primary means of handling the staff burden, with overtime being a distant second alternative. There was probably a processing calendar relationship to the burden responses as well, with the 4-year institutions (who would have had the most backtracking to do when the validation procedures were disseminated) having the greatest perceived burden and the proprietary schools (who would have the least 1982-83 processing completed by the time the validation procedures were finalized) having the least amount of additional burden.

One important facet of the reported burden and delay associated with the 1982-83 validation process should receive special note. The timing of the dissemination of the Validation Handbook appears to have been a major factor in the problems experienced by institutions, coming as it did after many schools had presumably completed processing their fall awards. The additional burden and delay would clearly have been less if the validation procedures had been known at the time SARs began to arrive at "traditional" institutions in the early spring. While the expanded number of validations obviously would have affected many institutions, even with an earlier start, at least some of the burden would have been dissipated by the lesser number of data elements to be validated, with a minimal net increase in burden as a result. Unfortunately, there was no satisfactory way to separate the timing factor from the expanded number of validations in our study data, so one can only speculate as to the exact cause.

5.3.4 Spring 1983 Analysis of Institutional Compliance

As noted in section 5.3.1, a very high percentage (94 percent) of recipients flagged for validation appeared to have the required documentation in their files as of the fall institutional visits. When this indicator of compliance was assessed during the spring institutional visits, the results were somewhat less indicative of thoroughness on the part of institutions. The first column of Table 5-11 shows the percent of cases selected for validation which had complete required documentation in the file at the time of spring data collection. Some 83 percent of the cases had documentation

TABLE 5-11

INCIDENCE OF FILE DOCUMENTATION FOR
STUDENTS SELECTED AND NOT SELECTED FOR VALIDATION

	Selected for Validation* (Weighted N=2110)	Not Selected For Validation* (Weighted N=1374)
Percentage With Complete Documentation	82.9	66.9
With Tax Return	66.4	49.9
With IRS Transcript	1.5	1.0
With State Tax Return	.2	.1
With W-2 Forms	.2	.2
With Statement From Student/Parent	.3	.4
With Statement of Nonfiling	12.7	14
With Other Documentation (includes use of earned income portion)	1.6	1.1
Percentage With Incomplete Documentation	17.0	33.0
Percentage Exempt From Validation	.1	.1

* Excludes students for whom documentated dependency status does not agree with application dependency status.

necessary for validation purposes, while 17 percent were incompletely documented and .1 percent were exempt from validation for one reason or another. The Federal tax return was the predominant form of documentation, as would be expected given the validation requirements in place.

In addition to the assessment of complete validation documentation reviewed above, the Institutional Questionnaire requested information about practices followed to enhance the quality of student data. Table 5-12 shows the institutionally reported practices other than required validation which presumably improved the accuracy of the data used to determine Pell Grant awards. Routine consistency checks for data elements were predominant, but only about one-third of institutions conducted 100 percent validation.

When these additional steps to increase the accuracy of student data were taken, student error did improve. Table 5-13 shows the percentage of cases and mean error for net student error, student overaward, and student underaward. While the percentage of cases with error was not significantly less for students attending institutions that indicated they routinely checked the consistency of Pell Grant application data against other file data, there was a sizeable lower mean error, as well as less mean overaward and mean underaward among students at those institutions. Considering the fact that this was a self-reported practice and that the activity was a Pell program requirement, schools may have been reluctant to admit they were not adhering to that requirement; the real difference between schools that did check consistency and those that did not may have been even greater.

Although fewer schools conducted 100 percent validation (validated unflagged as well as flagged cases) than did consistency checks, the pattern of results was the same. Table 5-14 indicates fewer cases with error remaining and between $33 and $68 lower mean error when 100 percent validation was conducted. Once again, there was evidence that institutional validation did make a difference in unresolved student error.

5.4 EFFECT OF VALIDATION UPON PELL GRANT APPLICANTS

The validation process not only affects institutions through the additional time and effort of receiving and reviewing documentation, but it also presumably makes demands of the applicants and their parents. We were interested in determining just

TABLE 5-12

PERCENTAGE OF PELL RECIPIENTS ATTENDING
INSTITUTIONS REPORTING VARIOUS QUALITY CONTROL PRACTICES

	Percentage of Recipients Attending (%)	Percentage of Institutions (%)
Institutions Routinely Check the Consistency of Pell Application Data against Other File Data		
Yes	89.4	88.1
No	10.6	11.9
Institutions Conduct 100 Percent Validation		
Yes	32.3	34.1
No	67.7	65.9

TABLE 5-13

AMOUNTS AND RATES OF STUDENT ERROR:
CONSISTENCY CHECKS VS. NO CONSISTENCY CHECKS

	Students Attending Institutions That Routinely Check Consistency Of Pell Application Information Against Other File Data (Weighted N=3022)	Students Attending Institutions That Do Not Check Consistency Of Pell Application Information Against Other File Data (Weighted N=359)
Total Net Student Error		
Percentage with error greater than $2	38.7	41.9
Mean net error per recipient with error ($)	160.7	198.3
Student Overaward		
Percentage with overaward	29.6	30.8
Mean overaward ($)	282.5	367.6
Student Underaward		
Percentage with underaward	9.1	11.1
Mean underaward ($)	-236	271.9

TABLE 5-14

AMOUNTS AND RATES OF STUDENT ERROR:
100% VALIDATION VS. NO 100% VALIDATION

	Students Attending Institutions That Conduct 100% Validation (Weighted N=1175)	Students Attending Institutions That Do Not Conduct 100% Validation (Weighted N=2458)
Total Net Student Error		
Percentage with error greater than $2	36.3	42.9
Mean net error per recipient with error ($)	191.80	228.10
Student Overaward		
Percentage with overaward	27.0	33.8
Mean overaward ($)	328.80	361.80
Student Underaward		
Percentage with underaward	9.3	9.0
Mean underaward ($)	-204.00	-272.30

how onerous the task of supplying validation documentation was perceived to be by those asked to comply. If the feedback obtained from the Student and Parent Questionnaires are were true indication, the "burden" did not seem large enough for any great concern.

Tables 5-15 and 5-16 display the frequency with which students and their parents remembered being asked to provide validation documentation, and any difficult they had understanding and complying with the instructions. The small percentage of students or parents recalling the request, when some 60 percent of all recipients were selected, suggests that it was not a great or important occurrence. No more than 10 percent of any category reported any problem understanding what they were to do to comply. Being able to comply without difficulty was a bit more troublesome, but only independent students and their parents had difficulty in more than 11 percent of the cases. It is understandable that the parents would have had somewhat more difficulty complying with the documentation request. They often had no involvement in completing the application in the first place and if so, did not feel any obligation to participate.

It seems reasonable to conclude from these data that the requests for validation documentation were making no great impression upon either applicants or their parents, and, with the exception of the parents of claimed independent applicants, were not approaching a burdensome level.

5.5 CONCLUSIONS

For 1982-83, the Department of Education required validation of about 60 percent of students by institutions, an increase from less than 10 percent in previous years. The focus of this validation was on adjusted gross income and taxes paid. The effectiveness of this increased validation in reducing error was reviewed and the following suggestions were made:

- Institutions fully complied with the requirement to validate in about 83 percent of the cases, despite the burden they reported it imposed. Most of the remaining cases were partially validated.
- Validation was effective in lowering error due to AGI and taxes paid, but as these were only the seventh and ninth highest causes of error, the overall effect on error was modest, though in the expected direction.

TABLE 5-15

FREQUENCY WITH WHICH STUDENTS AND PARENTS REPORTED DIFFICULTY WITH THE VALIDATION PROCESS, BY DEPENDENCY STATUS

	Dependent Students	Independent Students	Parents of Dependent Students	Parents of Independent Students
Percentage in sample reporting that they were selected for validation	24.4	28.5	20.1	19.9
Weighted Number Reporting Selection for Validation	503	414	330	37
Percentage reporting difficulty understanding instructions on what was needed to complete validation	7.2	5.4	6.4	7.5
Percentage reporting difficulty obtaining the documents needed to complete validation	8.8	12.8	4.2	21.6

TABLE 5-16

FREQUENCY WITH WHICH INDEPENDENT STUDENTS AND PARENTS OF DEPENDENT STUDENTS REPORTED DIFFICULTY WITH THE VALIDATION PROCESS, BY TYPE AND CONTROL OF INSTITUTION

	Proprietary		Private		Public	
	Less Than 2 Year	2 Year	2 Year	4 Year	2 Year	4 Year
Percentage reporting selection for validation	15.6	5.6	31.0	26.3	22.1	24.9
Weighted number reporting selection for validation	10	3	18	115	93	247
Percentage reporting difficulty with validation instructions	10.0	0.0	5.6	6.1	8.6	6.9
Percentage reporting difficulty obtaining documents for validation	0.0	0.0	5.6	7.8	8.6	10.9

- Validation had no effect on error due to incorrect reporting of dependency status, the largest source of student error. New validation procedures would be required to reduce this error.

CHAPTER 6
TRENDS IN PELL ERROR

The 1982-83 Pell Grant Quality Control Study is the third in a series of studies funded by the Office of Student Financial Assistance. While certain differences exist across studies in methodology, training, thoroughness, and definitions, it is still useful to inspect the changes in error over time. These comparisons give program managers and policy makers an opportunity to examine program trends and the overall effects of program changes. In general, the following can be concluded:

- The upward trend in error noted in 1980-81 has been turned around, as both student and institutional error dropped in 1982-83
- The amount of overawards has decreased while the amount of underawards has increased.

6.1 NATURE OF POSSIBLE COMPARISONS AND LIMITATIONS

In 1978-79, the first comprehensive Pell Grant (then Basic Grant) Quality Control Study provided an initial estimate of program-wide error. A second, more precise estimate was derived in 1980-81 and showed a disturbing upward trend in almost all components of error. As a result of both studies, several corrective actions were initiated. These included:

- More comprehensive computer edits of application data
- Increased validation of application data by financial aid administrators
- Data matches with other Federal agencies
- Expanded use of program reviews and financial audits
- Redesign of the application form and instructions, including extensive field testing
- Printing of the Statement of Educational Purpose directly on the SAR

It is therefore desirable to compare the results of the 1982-83 Pell Grant Study to the earlier work to see if the corrective actions have been successful. In this chapter we provide comparisons of error across the three points in time. These comparisons are made for program-wide and component absolute, net, overaward, and underaward errors. However, due to differences in methodology, program regulations, and the environment, conclusions drawn from the comparisons should be made cautiously. Among the considerations which influence the extent of comparability are the following:

- In 1978-79, data were collected in the late fall and early winter. In 1980-81 and again in 1982-83 data were collected in the late winter and early spring.
- In 1978-79, error computations were based on comparisons of verified student data with expected disbursement figures. In 1980-81 and 1982-83, error computations were based on comparisons of verified student data with actual disbursement figures.
- Both the 1980-81 and 1982-83 studies collected secondary verification documents which were not collected in 1978-79. These documents were Internal Revenue Service copies of tax returns, documentation from financial institutions on bank accounts, and tax assessor estimates of home values.
- In both 1980-81 and 1982-83, data from institutions were collected by people well experienced in financial aid operations. In 1978-79, this was not the case.
- Potential experimental bias was greatly reduced in 1982-83 from the previous studies through on-site selection of the recipient sample by the contractor.
- Social Security and VA Educational benefits were, for 1982-83 only, a direct adjustment to the Pell award, rather than an element in the aid index computations.
- For 1982-83, unlike prior years, estimated dependent student income was used instead of the previous year's income when the estimate was less than 60 percent of the previous year's reported income.
- For 1982-83, unlike prior years, the Student Aid Index computation formula was changed, using a progressive "taxation" rate on available income, rather than a flat percentage.
- The maximum Pell Grant award was $1,600 in 1978-79, $1,750 in 1980-81, and $1,800 in 1982-83.

6.2 CHANGES IN OVERALL LEVELS OF ERROR

Figure 6-1 depicts the trend in error from 1978-79 to 1982-83. Since the number of recipients varied across the years, it is most instructive to examine error per recipient. Average absolute error, net error, net student error, and net institutional error all dropped between 1980-81 and 1982-83. Except for net student error per recipient, all other average error figures are at their lowest point in four years.

In relative terms, absolute error per recipient, net error per recipient, net student error per recipient, and net institutional error per recipient are down 17 percent, 24 percent, 9 percent, and 49 percent respectively from the 1980-81 levels.

Figure 6-2 looks at overawards and underawards. Both the percentage of recipients receiving overawards and overaward dollars per recipient showed a decline of slightly under 20 percent from 1980-81. A 15.6 percent drop in overaward dollars per recipient since 1978-79 was achieved with no drop in the percentage of recipients with overawards, indicating a drop in the average overaward error. The percentage of recipients getting underawards and average underaward have been virtually unchanged over the three measurement periods.

In an overall comparison, the frequency and degree of error has shown a significant decline from 1980-81 to 1982-83 after rising from 1978-79. One or more of the elements of corrective action and regulatory change have been successful in reducing but not eliminating error. In the next section we examine how the various components of error have changed.

6.3 CHANGES IN ERROR COMPONENTS

In this section we examine the trends in the components of student and institutional error from 1980-81 to 1982-83. The 1978-79 study was not as complete in its examination of the components of error, so that comparability is difficult. It should be noted that even more caution must be excercised in comparing components of error because these sub-aggregates are most sensitive to changes in study methodology, program rules, and sampling error.

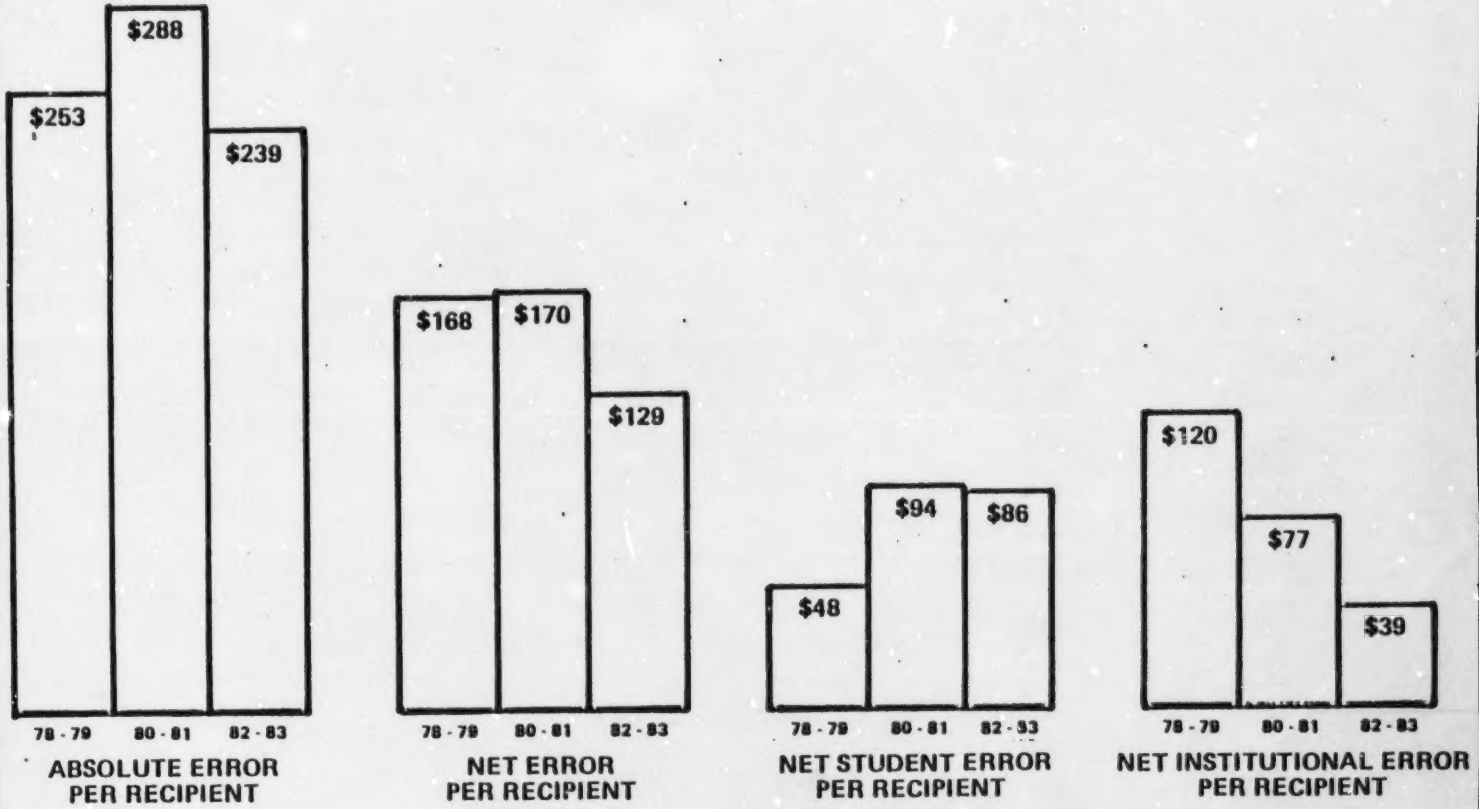

FIGURE 6-1

TRENDS IN PELL ERROR

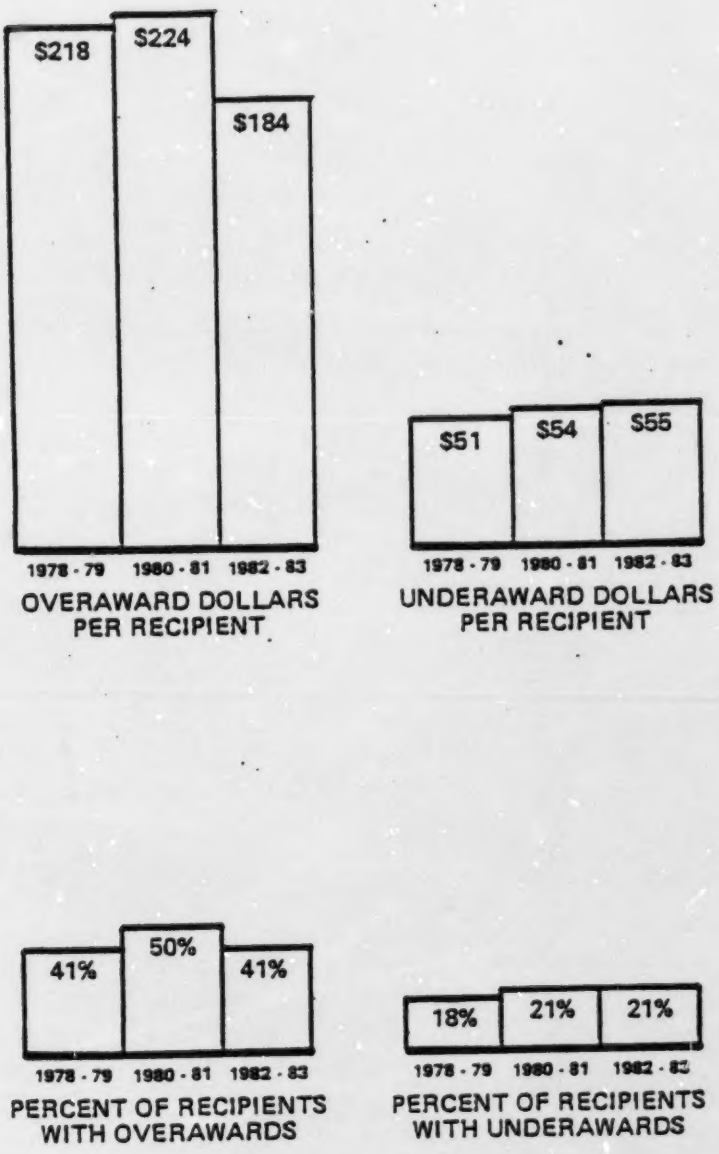

FIGURE 6-2

TRENDS IN OVERAWARDS AND UNDERAWARDS

6.3.1 Components of Student Error

Table 6-1 displays for 1980-81 and 1982-83 the net award error per recipient associated with each component of student error that exceeded $5 per recipient in 1980-81.

As already discussed in Chapter 5, there has been a 63 percent reduction in error associated with parents'/independent students' adjusted gross income, much of which can be attributed to the increase in validation. Dependency status and household size continue to be error-prone application items, even though they experienced modest declines. Other nontaxable income error more than doubled from 1980-81 to 1982-83. A possible reason for this would be the increase of transfer payments, especially unemployment compensation, between the two study years.

Other items showing more significant decreases include:

- Home Equity
- Net Student/Spouse Assets
- Net Student/Spouse Income
- Investment Equity.

The reasons for these decreases would include the possibility that home prices are now more stable than in earlier years and that the treatment of student/spouse income in the SAI computational formula has changed between the two years.

6.3.2 Components of Institutional Error

Table 6-2 lists the absolute award error per recipient associated with each component of institutional error for 1980-81 and 1982-83.

The most significant conclusion embodied in Table 6-2 is that the provision of the Statement of Educational Purpose directly on the SAR was effective, reducing

TABLE 6-1

THE COMPONENTS OF STUDENT ERROR: 1980-81 and 1982-83

		NET ERROR PER RECIPIENT		
		1980-81	1982-83	Percent Change
1.	Dependency Status	$ 26.70	$ 25.30	-5%
2.	Other Nontaxable Income/AFDC*	9.30	19.90	+114%
3.	Household Size	13.90	14.10	+1%
4.	Number in Postsecondary Education	5.90	9.60	+63%
5.	Home Equity	16.10	7.70	-52%
6.	Dependent Student's (and Spouse's) Assets	11.00	7.10	-35%
7.	Parents'/Independent Student's Adjusted Gross Income	16.10	6.70	-58%
8.	Dependent Student's (and Spouse's) Income	18.20	4.90	-73%
9.	Real Estate/Investment Equity	5.90	0.70	-88%
All Application Items		94.00	86.00	-9%

*These two application items were combined in 1980-81; thus we have added the net errors for Other Nontaxable Income ($19.20) and AFDC ($.70) for 1982-83 to provide a comparable figure.

TABLE 6-2

THE COMPONENTS OF INSTITUTIONAL ERROR: 1980-81 and 1982-83

	ABSOLUTE ERROR PER RECIPIENT		
	1980-81	1982-23	Percent Change
1. Program Eligibility Error*	$ 10.30	$ 10.50	+2%
2. No Statement of Educational Purpose	35.90	4.10	-89%
3. No Financial Aid Transcript	35.90	37.50	+4%
4. Cost of Attendance Error	26.60	19.30	-27%
5. Enrollment Status Error	39.90	58.10	+46%
6. Calculation/Accounting Error	12.30	22.40	+82%
Institutional Error	154.00	127.00	-18%

* Includes insufficient program length, less than half-time enrollment, nondegree programs, default on loan, not parent institution, and unsatisfactory academic progress

error of this type by 89 percent. Missing Financial Aid Transcripts continue to be a problem of similar severity.

Error associated with enrollment status has increased; however, some of this increase may be attributable to improved measurement in the 1982-83 study. Enrollment status will continue to be a problem because of its highly volatile nature. Study differences also may explain the change in calculation/accounting error.

CHAPTER 7
VALIDITY OF RESULTS

This chapter discusses three areas of critical importance to the findings, each of which reflects upon the validity of the results. Strictly speaking, these three areas--strength of documentation, nonresponse, and experimental bias--are methodological issues that might be placed in Volume 3 of this report, Procedures and Methods. Each, however, is included in this volume for a particular reason, as follows:

- Strength of documentation refers to our ability to collect data, from the multiple data sources, that assess the best values for the various application items. The more reliable and credible the source, the stronger our documentation and our ability to measure discrepancy and error accurately.

- Nonreponse bias refers to the effect of nonrespondents on the reliability and validity of the data. Any differences between respondents and nonrespondents must be assessed and their effects, if any, taken into account by weighting of the findings. This weighting is especially important in program-wide estimates of error, since we are making estimates about the population from our sample.

- Experimental bias refers to the effect of the data collection efforts on the findings. The issue is whether students or institutions participating in the study change their behavior because of their participation, and whether that behavior affects our findings.

More detail on some of the issues raised in this chapter is included in Volume 3, but the major points for an understanding of the findings are included here.

7.1 STRENGTH OF DOCUMENTATION

Our ability to measure error in the Pell program is a direct function of our ability to obtain documentation or evidence regarding the verified or best value for a particular item. For institutional items, such as eligibility components, disbursement, cost of attendance, and enrollment status, best values were determined by a careful review of documents in various institutional offices by our data collectors. Since our

data collectors were experienced in financial aid and higher education, they were able to review documents in financial aid offices, registrars' offices, bursars' offices, and residential living offices efficiently and accurately. For student items, the process was considerably more complicated.

Determining the best value for student application items involved personal interviews with students and their parents, reviews of the financial aid files at the institutions to find documentation presented to financial aid officers, and obtaining verification from third parties. The latter efforts involved requesting, reviewing, and coding more than 4,000 certified tax returns provided by the regional IRS offices and hundreds of records on home assets and financial assets from tax assessors and financial institutions, respectively.

For each application item, there were many sources of information and the potential for as many different values for an item as there were sources. The first task was to assign priorities to all of the possible sources according to the perceived strength of documentation for each. This involved both objective criteria (e.g., a certified copy of a tax return from the IRS is a more reliable or stronger source of documentation than either a photocopy of a worksheet used in preparation of the tax return or a statement provided by a professional tax preparer) and professional judgment. Judgment was required in areas of greater subtlety. Which, for example, is a better source of documentation for home value: an appraisal from a real estate office, a property insurance form, or a mortgage statement? According to our priorities these are listed in order, beginning with the strongest, but the mortgage statement is acceptable only if the house was purchased within the last three years.

Since different sources were provided as documentation according to dependency status, we first determined the best dependency status, along with items that were needed to determine documentation for other items. It was necessary, for example, to know the best value for both marital status and tax filing status before determining AGI. (If the best marital status was divorced, but the most recent tax return was married filed jointly, that tax return cannot be used unless there was evidence of the income portions attributable to each person.) Because of differences in possible documentation and Pell regulations, best values had to be separately determined for independent students, dependent students, and parents of dependent students.

Table 7-1 summarizes the strength of the sources of documentation used in determining best application values for major application items. The mean, standard deviation, and weakest acceptable documentation priority are given. The weakest acceptable priority is not necessarily indicative of the number of possible items of documentation, since any one priority may have multiple sources tied for a given rank. If, however, those sources were the same item (e.g., tax return worksheet) from two different places (parent interview and student's financial aid file), we always gave the documentation from the personal interview a higher priority.

Together the mean and standard deviation show the strength of the documentation available. For AGI, the mean of 1.64 placed it just below priority 1, out of 17. Priority one was a certified tax return from the IRS (Line 31 on the 1040 or Line 10 on the 1040A) from which any reported College Work-Study earnings (which are not considered part of AGI for the Pell) were subtracted. Priority two was a copy or worksheet of the same tax return shown to the student or parent interviewer. The narrow standard deviation shows that the priorities used in the majority of cases were tightly clustered near the strongest sources.

The number of cases with documentation and the percent of cases with documentation are provided next. Items with low percentages of documentation reported were typically those for which very few people had the income or asset in question. It was nearly impossible, for example, to document that one had not received Aid to Families with Dependent Children or did not own any real estate or have any other investments. The last column presents the percentage of cases whose best value was discrepant from that on the application. Application values within $2 of the best value were not considered discrepant, to be consistent with the definition used for error. For non-dollar items, any difference was considered to be a discrepancy.

On the whole, documentation for most application items was strong, as evidenced by low means and narrow standard deviations. Only home value appeared to have considerable variation in the documentation provided, perhaps reflecting that tax assessors' offices were contacted for only 25% of reported home owners. The proportion of cases with discrepant values varied widely, but tended to be highest for those items with fewer persons having the income or asset in question. Notable

TABLE 7-1

PRESENCE AND STRENGTH OF DOCUMENTATION FOR SELECTED APPLICATION ITEMS

	Strength of Documentation			Cases with Documentation		
	Mean	Standard Deviation	Weakest Acceptable	N	Percent	Percent Discrepant
Adjusted Gross Income	1.64	1.52	17	2,486	78.3	23.2
U.S. Taxes Paid	1.48	1.19	12	2,444	76.9	20.3
Applicant's/Father's Income	4.28	3.12	21	1,662	52.3	44.5
Spouse's/Mother's Income	4.51	3.39	21	1,339	42.2	34.0
AFDC	1.54	.70	4	154	4.8	63.6
Other Nontaxable Income [b]	1.02	.14	2	2,840	89.4	35.0
Child Support [c]	--	--	1	217	6.8	--[e]
Other Welfare [c]	--	--	1	93	2.9	--[e]
Non-Educational VA Benefits [c]	--	--	1	71	2.2	--[e]
Unemployment Compensation [d]	1.02	.14	2	2,119	66.7	--[e]
Interest/Dividend Exclusion [d]	1.02	.14	2	2,121	66.8	--[e]
Number of Exemptions	1.49	1.18	15	2,451	77.2	8.6
Household Size [f]	--	--	--	3,144	99.0	24.2
Number in Postsecondary Education [f]	--	--	--	3,167	99.7	14.6
Medical/Dental Expenses	3.43	2.38	9	1,055	33.2	71.5
Elementary/Secondary Tuition	1.08	.39	3	106	3.3	69.8
Cash/Savings/Checking	2.32	1.23	4 (DS) 5 (IS)	1,324	41.7	46.8[h]
Home Value	6.56	3.15	9	1,609	50.7	42.2
Home Debt	1.25	.83	6	678	21.4	78.5
Real Estate/Investment Value	1.38	1.10	5	107	3.4	89.7
Real Estate/Investment Debt [g]	1.72	1.21	5	61	1.9	62.3
Farm Equity/Farm Value	1.12	.59	4	26	0.8	--[e]
Farm Debt [g]	1.18	.72	4	34	1.1	--[e]
Business Value	1.07	.38	4	54	1.7	--[e]
Business Debt [f]	1.33	.73	4	46	1.4	--[e]
Parent's Social Security Benefits [j]	1.26	.48	4	155	7.7	88.4
Expected Social Security Educational Benefits	1.89	.91	4	110	3.5	5.4[h]
Expected VA Educational Benefits	1.85	1.20	4	48	1.5	95.8
Student Marital Status [ij]	--	--	--	3,168	99.8	9.6
Parent Marital Status [ij]	--	--	--	2,004	99.2	3.5
Dependent Student's (Spouse's) Income [bj]	1.13	.36	3	1,322	65.4	56.1[h]
Dependent Student's (Spouse's) Assets [bj]	1.00	0	2	2,018	99.9	58.8[h]

[a] Strongest sources are those with lowest numbers indicating highest priority. Comparisons across items cannot be directly made since a priority of, for example, 3 on one item may reflect a better source of documentation than a 3 on another.

[b] Includes some partially undocumented values to avoid the problem of failing to report one of the several contributing sources to this item because of lack of documentation.

[c] For these components of other nontaxable income (as well as others not shown here) undocumented values were accepted.

[d] These components of other nontaxable income could be documented for tax filers. For those who did not file a tax return, or for whom we received no tax return, undocumented values were accepted.

[e] Discrepancy could not be calculated on these subcomponents since the application requests total figures only.

[f] It is not possible to document these items since application questions were estimates for upcoming year; thus, cases shown represent all responses.

[g] Includes undocumented values to avoid the problem of reporting a documented value but no debt because of lack of documentation.

[h] Discrepant cases based on total of documented and undocumented cases.

[i] Largely undocumented; cases shown represent all responses.

[j] Percentage with documentation based on number of verified dependent students.

exceptions to this tendency were applicant's/father's income, spouse's/mother's income, other nontaxable income, and home value.

7.2 NONRESPONSE BIAS

Despite efforts to assure a high level of response during the course of the data collection, there were some cases that were functionally considered nonrespondents. The purpose of this section is to assess any bias that might have been introduced by nonrespondents and to detail our procedures for adjusting the sample for nonrespondents.

7.2.1 Overall Response Rates and Definitions of Nonresponse

Different definitions of nonresponse can be used for each of two different phases of the study. For interviewing, the response rate was simply the number of cases interviewed in a given group. Thus, 95 percent of the paired student and parent interviews for dependent students and student interviews only for independent students were successfully completed, after cases sampled in error had been removed from the sample. Yet this figure did not directly relate to the response rate for analytical purposes, since different criteria applied for a complete case.

For analysis, a case was considered complete if, for a dependent student, there was a student interview, a full parent interview, and a student record abstract. For independent students there must have been a student interview and a student record abstract. The requirement for a full parent interview presented unique problems for dependency status switchers. If, at the time of the interview, the student's change in status from independent to dependent was not known, a partial parent interview was scheduled. This interview included questions to establish or verify dependency status and household size, but stopped before a probe of income and assets was conducted. This was because parents of independent students were under no obligation to participate and we were sensitive to their concerns for privacy. If a dependency status change was apparent, an effort was made to complete a full parent interview. Often, however, the dependency status change was not evident until later, and an otherwise complete case became a functional nonrespondent because no income or asset information was available from the parent of the now-dependent student.

These and other response problems reduced the useful response rate for the study to over 86 percent, as measured by the ratio of complete cases to the sum of incomplete and complete cases. This is illustrated in Table 7-2.

7.2.2 Assessment of Nonresponse

The next stage in the process for nonresponse was to assess any differences that might exist between respondents and nonrespondents that could indicate nonresponse bias. To compare respondents and nonrespondents it was necessary to select data that were readily available but indicative of error for both groups. Since nonrespondents, by definition, were those for whom certain information was not available, the pool of data for comparison was limited to that in existing records. Four items that provided a good basis for comparison because of their likely reflection of error were SAI, scheduled award, expected disbursement, and number of transactions. These were available from recent records of the Pell Grant Disbursement System for both respondents and nonrespondents.

A series of multiple regression analyses were conducted for each of these dependent variables, with respondent status, dependency status, and selection for validation as additional regressors. The results revealed a need for nonresponse adjustment, as depicted in Table 7-3. There were significant predicted main effects for respondent status on scheduled award, expected disbursement, and number of transactions, with respondents having smaller awards and fewer transactions. There was no significant main effect for SAI.

7.2.3 Nonresponse Adjustment

Since response rates may differ according to student and institutional characteristics, separate adjustments were computed for each of numerous possible response groups into which individual recipients fell. We adjusted four characteristics of Regular Disbursement System (RDS) recipients:

Dependency Status (2 categories)
- Dependent
- Independent

TABLE 7-2

RESPONSES AND RESPONSE RATE FOR ANALYTIC PURPOSES

Number Sampled		4,109
Number Sampled in Error	422[a]	
Net Sample		3,687
Nonrespondents	512[b]	
Respondents		3,175

Response Rate = 3,175/3,687 = .861

---

[a] Sampled in error includes students not receiving a Pell at the institution indicated, students who dropped out of school at such a time that the full amount of any disbursements made was completely repaid, and dependent students whose parents had died or were out of the country.

[b] Nonrespondents include those without required interviews and those whose computed applicant record from the central processor could not be obtained because of damaged records on the processor's tape or failure to match Social Security numbers.

TABLE 7-3

REGRESSION ANALYSES TO ASSESS FOR NONRESPONSE BIAS

Model 1: Dependent Variable: SAI

Independent Variables:
Main Effect - Respondent Status (RESP)
Interaction Effect - Respondent Status by Dependency Status (DEPS)
Interaction Effect - Respondent Status by Selection for Validation (SEL)

Results: $R^2 = .116$, $p = .001$ ($df = 5, 3574$)

Sources of Variation:	df	F	p
RESP	1	.21	.6477
RESP x DEPS	2	204.62	.0001*
RESP x SEL	2	16.79	.0001*

Least Square Means for SAI:

Respondents	323.3
Nonrespondents	312.5

Model 2: Dependent Variable: Scheduled Award

Independent Variables: (Same as Model 1)

Results: $R^2 = .034$, $p = .0001$ ($df = 5, 3561$)

Sources of Variation:	df	F	p
RESP	1	6.12	.0134*
RESP x DEPS	2	52.54	.0001*
RESP x SEL	2	3.55	.0287*

Least Square Means for Scheduled Award

Respondents	1133.4
Nonrespondents	1195.5

Model 3: Dependent Variable: Expected Disbursement

Independent Variables: (Same as Model 1)

Results: $R^2 = .022$, $p = .0001$ ($df = 5, 3561$)

Sources of Variation:	df	F	p
RESP	1	7.01	.0081
RESP x DEPS	2	34.13	.0001*
RESP x SEL	2	1.41	.2434

Least Square Means for Expected Disbursement

Respondents	1076.6
Nonrespondents	1142.8

Model 4: Dependent Variable: Number of Transactions

Independent Variables: (Same as Model 1)

Results: $R^2 = .052$, $p = .0001$ ($df = 5, 3591$)

Sources of Variation:	df	F	p
RESP	1	33.42	.0001*
RESP x DEPS	2	79.97	.0001*
RESP x SEL	2	4.95	.0071*

Least Square Means for Number of Transactions

Respondents	1.46
Nonrespondents	1.72

*Statistically significant.

Type and Control of Institution (6 categories)	- Public 2-3 years - Public 4 years or more - Private 2-3 years - Private 4 years or more - Proprietary less than 2 years - Proprietary 2-3 years
Validation Status (2 categories)	- Selected for Validation - Not Selected for Validation
SAI (5 categories)	- 0 - 1 - 400 - 401 - 800 - 801 - 1,200 - 1,201 - 1,600

In addition, we adjusted for three other groups:

Alternate Disbursement System (ADS) Recipients

Independent to Dependent Dependency Status Switchers

Dependent to Independent Dependency Status Switchers

Adjustment for any cell was based on the reponse rate, r_i:

$$r_i = \frac{\text{number completed}}{\text{number complete + number incomplete}}$$

If the denominator of any r_i was less than 25 that group was combined with an adjacent cell or cells. The first choice for combining cells was type and control of institution, followed by validation status.

Inability to assign all cases to a cell necessitated an additional group for persons with missing application values on any of the four characteristics upon which assignment was based. After combining groups with small denominators, 49 cells were created. For each cell the nonreponse adjustment weight was the inverse of the response rate or $1/r_i$. The resulting cells and nonresponse adjustments are shown in Table 7-4.

These nonresponse adjustment weights were used in all tables dealing with error to produce means, program-wide estimates, and percentage of cases with error, unless otherwise noted.

TABLE 7-4

NONRESPONSE ADJUSTMENT WEIGHT BY SELECTION CHARACTERISTICS

Group	Type and Control						Validation Selection		Dependency Status[a]	SAI Group[b]	Number of Complete and Incomplete Cases	Number of Complete Cases	Nonresponse Adjustment Weight[d]
	Prop 1	Prop 2	Pvt 2	Pub 2	Pvt 4	Pub 4	Selected	Not Selected					
1	X	X	X				X		D	0	29	27	1.0741
2				X			X		D	0	84	70	1.2000
3					X		X		D	0	74	67	1.1045
4						X	X		D	0	138	124	1.1129
5	X	X	X					X	D	0	46	43	1.0698
6				X				X	D	0	95	83	1.1446
7					X			X	D	0	45	39	1.1538
8						X		X	D	0	79	67	1.1791
9	X	X	X	X			X		D	1	78	73	1.0685
10					X		X		D	1	75	69	1.0870
11						X	X		D	1	165	151	1.0927
12	X	X	X	X				X	D	1	61	57	1.0702
13					X			X	D	1	33	26	1.2692
14						X		X	D	1	73	68	1.0735
15	X	X	X	X			X		D	2	44	42	1.0476
16					X		X		D	2	77	71	1.0845
17						X	X		D	2	153	142	1.0775
18	X	X	X	X				X	D	2	41	36	1.1389
19					X	X		X	D	2	63	54	1.1667
20	X	X	X	X			X		D	3	49	46	1.0652
21					X		X		D	3	67	61	1.0984
22						X	X		D	3	144	135	1.0667
23	X	X	X	X				X	D	3	30	26	1.1538
24					X	X		X	D	3	54	47	1.1489
25	X	X	X	X	X		X		D	4	64	60	1.0667
26						X	X		D	4	120	117	1.0256
27	X	X	X	X	X			X	D	4	36	32	1.1250
28						X		X	D	4	37	27	1.3704
29	X	X	X				X		I	0	30	27	1.1111
30				X			X		I	0	121	106	1.1415
31					X		X		I	0	50	48	1.0417
32						X	X		I	0	317	294	1.0782
33	X							X	I	0	39	34	1.1471
34		X	X					X	I	0	39	30	1.3000
35				X				X	I	0	141	116	1.2155
36					X			X	I	0	45	35	1.2857
37						X		X	I	0	117	96	1.2188
38	X	X	X	X			X		I	1	25	23	1.0870
39					X	X	X		I	1	45	44	1.0227
40	X	X	X	X	X	X		X	I	1	54	43	1.2558
41	X	X	X	X	X	X	X		I	2	54	50	1.0800
42	X	X	X	X	X	X		X	I	2	43	34	1.2647
43	X	X	X	X	X	X	X		I	3	39	36	1.0833
44	X	X	X	X	X	X		X	I	3	48	37	1.2973
45	X	X	X	X	X	X	X	X	I	4	49	34	1.4412
46	Independent to Dependent Status Switchers										184	66	2.7879
47	Dependent to Independent Status Switchers										13	11	1.1818
48	ADS Recipients										23	16	1.4375
49	Unassigned[c]										70	197	1.0000

[a] D = Dependent I = Independent

[b] SAI Group
0 = 0
1 = 1 - 400
2 = 401 - 800
3 = 801 - 1200
4 = 1201 - 1600

[c] To avoid introducing unknown bias to this group with missing characteristics, a nonreponse adjustment of 1 was used. This leads to a slight underestimation of error.

[d] Mean nonresponse adjustment weight = 1.1501

7.2.4 Sensitivity Analysis Using Alternate Nonresponse Assumptions

The error adjustment procedures described for nonrespondents provided a means for arriving at error estimates for the population. While we are confident that these procedures yielded reasonable estimates, we recognize that using other assumptions for nonrespondents would yield different error estimates. In this section we predict some error estimates for net case error and net total error based on a series of simple assumptions about nonrespondents. These estimates can be compared to the estimates obtained using the nonrespondent adjustment weights described above. This approach can be called sensitivity analysis because it shows the sensitivity of error estimates to varying nonresponse assumptions.

A series of five alternate assumptions regarding nonrespondents were selected for this sensitivity analysis. These assumptions were based on their reasonableness, determined in part from a similar analysis conducted for the 1980-81 data. Table 7-5 shows net error estimates using the following alternative assumptions for mean error per recipient:

- Mean error for nonrespondents was equal to that of respondents.
- Mean error for nonrespondents was equal to the 95th percentile of mean error for respondents.
- Mean error for nonrespondents was equal to the 90th percentile of mean error for respondents.
- Mean error for nonrespondents was equal to the 75th percentile of mean error for respondents.
- Mean error for nonrespondents was equal to the 50th percentile (median) of mean error for respondents.

The first and the last assumptions used different measures of central tendency, the mean and the median for respondents, as the basis for determining nonrespondent error and program-wide estimates. The other estimates were based on the assumption that nonrespondent error was equal to that of a selected percentile of respondent error.

The formula for the mean error used in these sensitivity analyses relies upon the proportion of respondents (.861) and nonrespondents (.139) derived from the data in Table 7-2. Thus:

Mean error = (r) (mean error for respondents) + (1-r) (assumed error for nonrespondent(s), where

r = proportion of respondents in the net sample

The program-wide estimate of error was simply the mean error multiplied by the estimated 2.53 million Pell recipients.

An inspection of the results in Table 7-5 reveals that the estimates derived from the nonresponse adjustment weights (shown in the last line of Table 7-5, as taken from Table 2-1) fall in the middle range of the estimates reported using the alternative assumptions.

7.3 EXPERIMENTAL BIAS

Experimental bias refers to the effects of the treatment (in this case, interviewing students and their parents, interviewing financial aid administrators, and reviewing student financial aid files) on the outcome (in this case error or any behavior of students, parents, or financial aid administrators that may affect error). Experimental bias is a potential problem in any type of study where people can react in ways that influence the outcome.

In the conduct of any study involving extensive intervention, experimental bias cannot be eliminated. Considering the attention given to the findings of Stage One within the financial aid community and the response to the imposition of more extensive validation for 1982-83, institutions notified in late 1982 of their selection for Stage Three may have reacted. To the extent that differences exist between sampled and nonsampled students on variables used for calculating student and institutional error, experimental bias can be assessed.

To assess the extent to which institutions treated sampled students differently than nonsampled students, we collected information on a control group sample of students. This institutional control group (ICG) consisted of 611 nonsampled recipients at 263 of the sampled institutions. Neither the students nor the institutions were aware of this control group in advance of the institutional visit. The data collected were restricted to items readily available in the student's financial aid file

TABLE 7-5

ERROR ESTIMATES USING ALTERNATIVE ASSUMPTIONS FOR NONRESPONDENTS

Assumption for Nonrespondents	Net Case Error			Net Total Error		
	Program-Wide Estimate ($ Millions)	Mean Error per Recipient ($)	Mean Nonrespondent Error per Recipient ($)	Program-Wide Estimate ($ Millions)	Mean Error per Recipient ($)	Mean Nonrespondent Error per Recipient ($)
Respondents and nonrespondents have equal error	288	114	114	283	112	112
Nonrespondents have error equal to percentile of respondent error:						
95th percentile	590	233	974	657	260	1,175
90th percentile	451	178	579	404	160	456
75th percentile	305	121	165	260	103	45
50th percentile	247	98	0	244	96	0
Nonresponse adjustment weights used for nonrespondents (method used elsewhere in this report)	326	129	--	316	125	--

and thus could be collected without the student or institution being able to alter their behavior. Values for these variables could then be compared for regularly sampled students and the blind sample or control group. If the students altered their behavior because of selection for the study, we would expect them to have lower SAIs, more transactions, and lower expected disbursements than the control group students who were not aware of the data collection.

Table 7-6 compares the average values for seven selected items for sampled and ICG students. For only one item, Social Security educational benefits, was the difference greater than four percent. Generally, the differences were between one and two percent. Therefore, the results support the conclusion that the sampled institutions treated sampled students no differently than other aid recipients.

Information was also collected on the frequency of institutional eligibility errors. Table 7-7 displays the frequency of the eleven types of institutional eligibility error for sampled and ICG students. If schools treated sampled students more carefully in order to appear less error-prone, we would expect higher error rates for the control group. While the rates were higher for some items, the likelihoods of these errors were so low that comparisons at the detailed level can only be made with great caution. Overall, the incidence of eligibility error was lower for the control group, which was contrary to what would be expected if institutions were altering their behavior and creating experimental bias.

A final assessment of experimental bias involved the use of appreciably more control group data. This was accomplished in several steps:

- Drawing a random sample of 20,000 applicants from the Computed Applicant Record (CAR) maintained by the Pell central processor
- Matching this random sample with the Pell Recipient History File to exclude nonrecipients and obtain the institution attended, scheduled award, and expected disbursement
- Separating the random recipient file into two groups:
  - -- 1,313 additional students at sampled institutions to expand the size of the ICG to a total of 1,924 (expanded ICG)
  - -- 6,013 students at nonsampled institutions to use as an additional control group (CAR-CG).

TABLE 7-6

COMPARISON OF SELECTED ITEMS TO ASSESS EXPERIMENTAL BIAS

Item	Sampled Students		Control Group Students	
	Number of Cases[1]	Average Value	Number of Cases	Average Value
SAI	3,742	366.82	611	352.97
Scheduled Award	3,452	1,126.94	565	1,140.55
Expected Disbursement	3,416	1,073.01	569	1,089.87
Social Security Educational Benefits	312	1,430.31	54	1,580.22
VA Educational Benefits	59	2,980.75	8	2,955.00
Cost of Attendance	3,451	3,521.09	568	3,465.71
Transaction Number	3,759	1.55	608	1.54

[1] The number of cases for sampled students is higher in this table than elsewhere in the report because of the less demanding data requirements of this analysis.

TABLE 7-7

COMPARISON OF INSTITUTIONAL ELIGIBILITY PROGRAM ERRORS TO ASSESS EXPERIMENTAL BIAS

Error	Sampled Students (N = 3786)		Control Group Students (N = 611)	
	N	%	N	%
No SAR in file	4	.11	0	0
Invalid SAR	15	.40	2	.32
Statement of Educational Purpose not signed	20	.53	4	.65
Less than half-time enrollment	11	.29	4	.65
Satisfactory academic progress guidelines not followed	16	.42	3	.49
Program less than six months	1	.03	0	0
Nondegree student	17	.45	0	0
Student has BA degree	2	.05	1	.16
Not parent school	10	.26	0	0
No Financial Aid Transcript	135	3.57	16	2.62
Default Eligibilty errors	3	.08	0	0
Total Eligibility Errors	234	6.18	30	4.91

[1] The number of cases for sampled students is higher in this table than elsewhere in the report because of the less demanding data requirements of this analysis.

Experimental bias within institutions refers to the differential treatment of sampled students and nonsampled students by the sampled institutions. It was assessed separately for certainty institutions (those 34 institutions in the study whose large numbers of Pell recipients made the institution certain to be included in the institutional sample) and noncertainty institutions by comparing the mean SAI, number of transactions, scheduled award, and expected disbursement for sampled students and nonsampled (expanded ICG) students. The results are shown in Table 7-8. For both certainty institutions and noncertainty institutions there were no significant differences in the expected direction between the sampled students and the control group on number of transactions, SAI, scheduled award, and expected disbursement. (If experimental bias existed, students at sampled schools would have a significantly higher number of transactions and SAI and significantly lower values for scheduled award and expected disbursement.) Thus, there is no reason to believe that anything in the study influenced the sampled students to change their behavior in any way that seriously affected the Pell Grant.

Experimental bias across institutions refers to differential treatment of nonsampled students at sampled institutions (expanded ICG) and nonsampled students at nonsampled institutions (CAR-CG). Meaningful differences might indicate that selected institutions tightened their review procedures or persuaded the students to institute changes. As Table 7-8 shows, there were no significant differences in the expected direction in number of transactions or SAI between the groups, suggesting no changed student behavior. Students at sampled institutions had statistically significant lower scheduled awards and expected disbursements which would be consistent with the expected direction of any bias. However, the small magnitude of these differences, the extremely large numbers involved, and the findings on SAI suggest that the differences were not meaningful. Thus, there was also no evidence of experimental bias across institutions.

The results confirm that there was no systematic experimental bias brought about by the conduct of the interviews and record abstracts. The procedures used were methodologically sound and posed no threat to the validity of the results.

TABLE 7-8

DIFFERENCES BETWEEN MEANS OF KEY MEASURES FOR ASSESSING EXPERIMENTAL BIAS

Type of Experimental Bias and School	Mean Measures	Sampled Students at Sampled Schools	Nonsampled Students at Sampled Schools	Statistical Procedure t	df	p
Within Institution for Certainty Schools		(N = 273)	(N = 586)			
	Number of transactions	1.55	1.49	.90	857	>.05
	SAI	338	349	-.32	857	>.05
	Scheduled award	1,153	1,144	.29	857	>.05
	Expected disbursement	1,097	1,020	2.33	857	>.05
Within Institution for Noncertainty Schools		(N = 2,886)	(N = 1,338)			
	Number of transactions	1.50	1.54	-1.25	4,223	>.05
	SAI	377	360	1.12	4,223	>.05
	Scheduled award	1,097	1,081	1.04	4,223	>.05
	Expected disbursement	1,046	1,003	2.62	4.223	>.05

	Mean Measures	Nonsampled Students at Sampled Schools	Nonsampled Students at Nonsampled Schools	Statistical Procedure t	df	p
Across Institution for Noncertainty Schools**		(N = 1,338)	(N = 6,013)			
	Number of transactions	1.54	1.50	1.32	7,350	>.05
	SAI	360	308	3.70	7,350	>.05
	Scheduled award	1,081	1,173	-6.34	7,350	<.05*
	Expected disbursement	1,003	1,032	-1.88	7,350	<.05*

*Statistically significant using a one-tailed test..
**There can be no across institution measure of bias for certainty schools because all certainty schools are sampled.

APPENDIX

APPENDIX

ERROR DEFINITIONS AND EQUATIONS

A central concern was the development of appropriate definitions for error in the Pell Grant program. In the broadest sense, error is simply the discrepancy between the dollar amount of Pell awards actually disbursed and the correct amount that should have been disbursed. The determination of these correct amounts is based upon the "best values" for each item as collected from the various sources.

Great attention was directed toward the successful collection of information and documentation that could be used to verify the values reported by applicants (both students and their parents) and used by institutions in the determination of the Pell award. The methodology of the study is based on the assumption that in the absence of information to contradict a reported figure that figure must be presumed correct. In other words, if no documentation of error could be identified for any item in any case, error was presumed to be zero. This assumption must be made in a confirmatory study of this sort, since in the majority of cases it is likely that little or no error exists. The result is a tendency toward underestimation of error. This tendency is countered methodologically by the efforts to secure verifying information from multiple data sources. This greatly increased the chance that error would be found and decreased the chance that cases must be omitted from the sample because of the inability to obtain any supporting documentation.

The determination of the Pell award is based on a somewhat complex formula. The crucial elements are the SAI, the cost of attendance, the assertion that eligibility requirements have been met, and pro-rating the award for less than full-time, full-year enrollment status, if applicable. The resulting amount is called the Unajusted Expected Disbursement (UED). After UED is calculated, it is checked against another award formula, the Maximum Expected Disbursement (MED). The MED takes into account two items, student Social Security benefits and Veterans

Administration educational benefits, that are excluded from the UED formula. The formula for the MED is:

MED = Cost of Attendance - SAI - Social Security Educational Benefits - 1/3 VA Educational Benefits, pro-rated for less than full time, full-year enrollment status, if applicable.

The MED sets a maximum. Thus, the lower of UED or MED is called the Adjusted Expected Disbursement (AED).

The equations which follow indicate the sources of the values that will be used in each error computation. The algebraic computation of AED will follow ED regulations. Each formula uses a series of standard abbreviations. These are:

AED - Adjusted Expected Disbursement, with data values used in its computation shown parenthetically

AD - Actual Disbursement, the sum of disbursements already made by the institution and disbursements planned by the institution

SAI - Student Aid Index

COST - Cost of Attendance

ENROLL - Enrollment Status

ELIG - Categorical Eligibility

EB - Educational Benefits

The last four abbreviations (SAI, COST, ENROLL, ELIG) are always shown with a subscript indicating which of the multiple values is to be used for that equation. These subscripts are:

b - Value from SAR/CAR or SRA (as transcribed from Section 3 of file SAR) used by institution for determining award

* - Best value as determined by Advanced Technology according to merge priorities.

For example, the expression AED (SAI*, $COST_b$, ENROLL*, $ELIG_b$, EB*) would mean the value of the adjusted expected disbursement calculated based on the "best" values for SAI, ENROLL, and EB and the SAR values for COST, and ELIG.

For purposes of clarity, these error equations are shown for total error, student error and its major parts, and institutional error and its major parts.

The error equations are:

CASE ERROR

AD - AED (SAI*, COST*, ENROLL*, ELIG*, EB*)

STUDENT ERROR

Overall

AED (SAI_b, COST*, ENROLL*, ELIG*, EB_b)
- AED (SAI*, COST*, ENROLL*, ELIG*, EB*)

Components and Items of Student Error

AED (SAI_b, $COST_b$, $ENROLL_b$, $ELIG_b$, EB_b)
- AED (SAI_b/*, $COST_b$, $ENROLL_b$, $ELIG_b$, EB_b/*),
where SAI_b/* and EB_b/* are calculated using b values for all elements of student error except the element(s) to be identified for error, which use(s) * values

INSTITUTIONAL ERROR

Overall

AD - AED (SAI_b, COST*, ENROLL*, ELIG*, EB_b)

Eligibility Error[1]

AED (SAI_b, $COST_b$, $ENROLL_b$, $ELIG_b$, EB_b)
- AED (SAI_b, $COST_b$, $ENROLL_b$, ELIG*, EB_b)

Components and Items of Eligibility Error (Includes SEP/FAT Error)

AED (SAI_b, $COST_b$, $ENROLL_b$, $ELIG_b$, EB_b)
- AED (SAI_b, $COST_b$, $ENROLL_b$, $ELIG_b$/*, EB_b),
where $ELIG_b$/* is calculated using b values for all elements of eligibility error except the element(s) to be identified for error, which use(s) * values

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[1]Due to the high proportion of missing data for $ENROLL_b$ it was necessary to use an imputed value which was the ratio of actual disbursement to scheduled award. The value of scheduled award was from the institutional copy of the SAR while actual disbursement was obtained from the Student Record Abstract.

Disbursement Error

$AD - AED (SAI_b, COST^*, ENROLL^*, ELIG_b, EB_b)$

Cost of Attendance Error

$AED (SAI_b, COST_b, ENROLL_b, ELIG_b, EB_b)$
$- AED (SAI_b, COST^*, ENROLL_b, ELIG_b, EB_b)$

Enrollment Status Error

$AED (SAI_b, COST_b, ENROLL_b, ELIG_b, EB_b)$
$- AED (SAI_b, COST_b, ENROLL_b, ELIG^*, EB_b)$

Calculation and Accounting Error

$AD - AED (SAI_b, COST_b, ENROLL_b, ELIG_b, EB_b)$

Several features of these equations should be discussed, as they influenced the final equations. First, it was considered essential that the sum of overall student error and overall institutional error equal total error. This permits direct presentation of the amount of error attributable to each of these two main sources and maintains consistency of these key equations with Stage One. (In order to achieve this additivity, the * values for institutional variables were used in the overall student error equation instead of the b values. This has little impact on the resulting student error because of their inclusion in both terms of the equation.)

Second, within the overall student error, the components and items of error are not additive. The overlapping contributions of the variables to SAI prevent additivity, but the equation still permits their relative contributions to overall student error to be shown. A similar equation was used in Stage One, but some refinements have been made to assure that the relative contributions are accurately stated.

Third, the two major components of institutional error -- eligibility and disbursement--are not additive. This permits accurate presentation of the amount of eligibility error from a base using all actual data.

Finally, within disbursement error, the equations for cost of attendance error, enrollment status error, and calculation and accounting error are not additive. This allows consistency in the determination of each and assures the accuracy of their relative contributions to error.